2.0 Summary of Existing Environmental Studies

An EBS was conducted by ESE to document current environmental conditions of all FTMC property (ESE, 1998). The study was to identify sites that, based on available information, have no history of contamination and comply with U.S. Department of Defense guidance for fast-track cleanup at closing installations. The EBS also provides a baseline picture of FTMC properties by identifying and categorizing the properties by seven criteria:

1. Areas where no storage, release, or disposal of hazardous substances or petroleum products has occurred (including no migration of these substances from adjacent areas)

2. Areas where only release or disposal of petroleum products has occurred

3. Areas where release, disposal, and/or migration of hazardous substances has occurred, but at concentrations that do not require a removal or remedial response

4. Areas where release, disposal, and/or migration of hazardous substances has occurred, and all removal or remedial actions to protect human health and the environment have been taken

5. Areas where release, disposal, and/or migration of hazardous substances has occurred, and removal or remedial actions are underway, but all required remedial actions have not yet been taken

6. Areas where release, disposal, and/or migration of hazardous substances has occurred, but required actions have not yet been implemented

7. Areas that are not evaluated or require additional evaluation.

The EBS was conducted in accordance with protocols of the Community Environmental Response Facilitation Act (CERFA) (CERFA-Public Law 102-426) and U.S. Department of Defense policy regarding contamination assessment. Record searches and reviews were performed on all reasonably available documents from FTMC, ADEM, EPA Region 4, and Calhoun County, as well as a database search of CERCLA-regulated substances, petroleum products, and facilities regulated by the Resource Conservation and Recovery Act. Available historical maps and aerial photographs were reviewed to document historical land uses. Personal and telephone interviews of past and present FTMC employees and military personnel were conducted. In addition, visual site inspections were conducted to verify conditions of specific property parcels.

The Former 81mm Mortar Range, Parcel 137Q-X, is an area where no known or recorded storage, release, or disposal (including migration) has occurred on site property. The parcel, however, was qualified because chemicals of potential concern and UXO may be present as a result of range activities. Therefore, Parcel 137Q-X required additional evaluation to determine its environmental condition.

The following sections summarize site investigation (SI) activities conducted in June/July 2002 by IT at the Former 81mm Mortar Range, Parcel 137Q-X, including UXO avoidance activities, environmental sampling and analysis, and groundwater monitoring well installation activities.

2.1 Site Investigation

The purpose of the SI at the Former 81mm Mortar Range, Parcel 137Q-X, was to determine the presence or absence of potential site-specific chemicals (PSSC) and to recommend further actions, if appropriate. The scope of the SI was outlined in the *Site-Specific Field Sampling Plan, Site-Specific Safety and Health Plan, and Site-Specific Unexploded Ordnance Safety Plan Attachments Former 81mm Mortar Range, Parcel 137Q-X* (IT, 2002c). UXO avoidance was performed at Parcel 137Q-X, following methodology outlined in the SAP. IT UXO personnel used a low-sensitivity magnetometer to perform a surface sweep of the parcel prior to site access. After the site was cleared for access, sample locations were monitored by UXO personnel following procedures outlined in the SAP (IT, 2000a, 2002a). The following sections summarize the SI activities conducted at Parcel 137Q-X.

2.1.1 Summary of Field Activities

SI field activities at the Former 81mm Mortar Range, Parcel 137Q-X, consisted of collection and analysis of 15 surface soil samples, 6 depositional soil samples, 15 subsurface soil samples, and 3 groundwater samples. In addition, four monitoring wells were installed to facilitate collection of groundwater samples and to provide site-specific geological and hydrogeological characterization information. However, only three monitoring wells produced sufficient groundwater for sampling. The sample locations, media, and rationale for the SI at Parcel 137Q-X are summarized in Table 2-1. Sampling locations for the SI at Parcel 137Q-X are shown on Figure 2-1. Sample collection logs are included in Appendix B.

Samples collected during the SI at Parcel 137Q-X were analyzed for the following parameters using EPA SW-846 methods, including Update III methods where applicable:

- Target analyte list metals – EPA Methods 6010B/7471A
- Nitroaromatic/nitramine explosives – EPA Method 8330.

Table 2-1

Site Investigation Sampling Locations and Rationale
Former 81mm Mortar Range, Parcel 137Q-X
Fort McClellan, Calhoun County, Alabama

Sample Location	Sample Media	Sample Location Rationale
HR-137Q-MW01	Surface soil, subsurface soil and groundwater	Surface soil, subsurface soil, and groundwater samples were collected in the south-central portion of the site, east of the truck bed and possible STB drums, and west of the stream channel. Sample data was used to determine if contaminant releases into the environment impacted site media and to assess potential impacts to terrestrial biota that might utilize the site for food and/or habitat. A monitoring well was installed to establish the local groundwater flow direction and site-specific geology.
HR-137Q-MW02	Surface soil, subsurface soil and groundwater	Surface soil, subsurface soil, and groundwater samples were collected northeast of the trench and STB drums. Sample data was used to determine if contaminant releases into the environment impacted site media and to assess potential impacts to terrestrial biota that might utilize the site for food and/or habitat. A monitoring well was installed to establish the local groundwater flow direction and site-specific geology.
HR-137Q-MW03	Surface soil and subsurface soil	Surface and subsurface soil samples were collected in the central portion of the site investigation area, approximately 75 feet northwest of the trench and pit. Sample data was used to determine if contaminant releases into the environment have impacted site media and to assess potential impacts to terrestrial biota that might utilize the site for food and/or habitat. A monitoring well was installed approximately 155 feet northwest of the trench and pit to characterize the site-specific geology. The well was dry during several attempts to sample it.
HR-137Q-MW04	Surface soil, subsurface soil and groundwater	Surface soil, subsurface soil, and groundwater samples collected approximately 75 feet southwest of the trench and pit. Sample data was used to indicate if contaminant releases into the environment have impacted site media and to assess potential impacts to terrestrial biota that might utilize the site for food and/or habitat. A monitoring well was installed to establish the local groundwater flow direction and site-specific geology.
HR-137Q-GP01	Surface soil and subsurface soil	Surface and subsurface soil samples were collected west of the secondary road on the west side of the site, and approximately 15 feet north from a disturbed area with a rusted truck bed. Sample data was used to indicate if contaminant releases into the environment have impacted site media and to assess potential impacts to terrestrial biota that might utilize the site for food and/or habitat purposes.
HR-137Q-GP02	Surface soil and subsurface soil	Surface and subsurface soil samples were collected approximately 15 feet northwest of the disturbed area with possible STB drums. Sample data was used to indicate if contaminant releases into the environment have impacted site media and to assess potential impacts to terrestrial biota that might utilize the site for food and/or habitat purposes.
HR-137Q-GP03	Surface soil and subsurface soil	Surface and subsurface soil samples were collected approximately 15 feet southeast of a disturbed area with a possible STB drum. Sample data was used to indicate if contaminant releases into the environment have impacted site media and to assess potential impacts to terrestrial biota that might utilize the site for food and/or habitat purposes.
HR-137Q-GP04	Surface soil and subsurface soil	Surface and subsurface soil samples were collected in the trench, approximately 70 feet east of the intermittent stream channel and 20 feet southeast of two surface depressions. Sample data was used to indicate if contaminant releases into the environment have impacted site media and to assess potential impacts to terrestrial biota that might utilize the site for food and/or habitat purposes.
HR-137Q-GP05	Surface soil and subsurface soil	Surface and subsurface soil samples were collected approximately 40 feet east of the stream channel, and 15 feet west of a disturbed area in the eastern-central portion of the site. Sample data was used to indicate if contaminant releases into the environment have impacted site media and to assess potential impacts to terrestrial biota that might utilize the site for food and/or habitat purposes.

Table 2-1

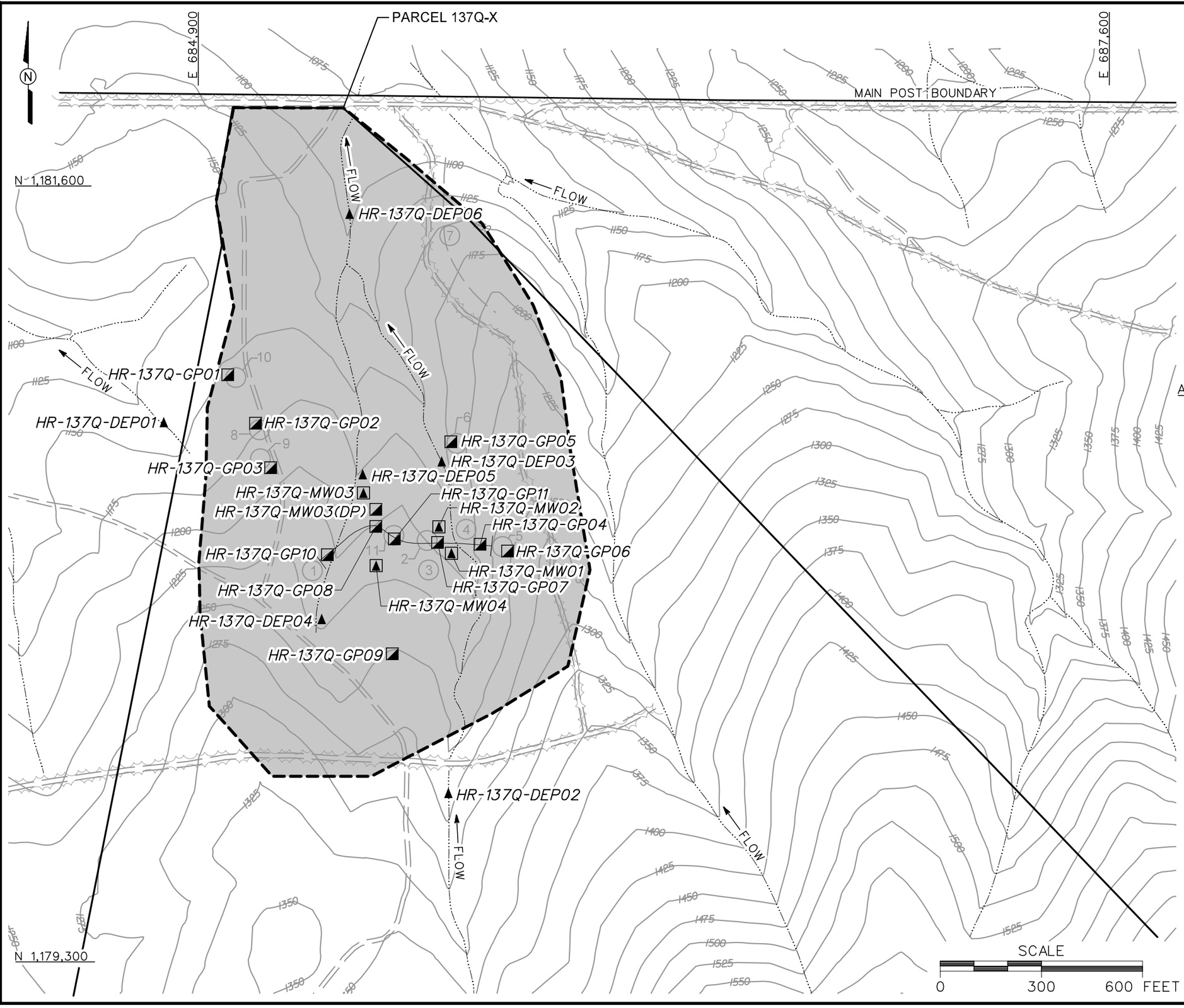
Site Investigation Sampling Locations and Rationale
Former 81mm Mortar Range, Parcel 137Q-X
Fort McClellan, Calhoun County, Alabama

Sample Location	Sample Media	Sample Location Rationale
HR-137Q-GP06	Surface soil and subsurface soil	Surface and subsurface soil samples were collected in the southeast portion of the site, west of the secondary road, and southeast of a surface depression. Sample data was used to indicate if contaminant releases into the environment impacted site media and to assess potential impacts to terrestrial biota that might utilize the site for food and/or habitat purposes.
HR-137Q-GP07	Surface soil and subsurface soil	Surface and subsurface soil samples were collected in the trench, approximately 30 feet east of the STB drums, in the south-central portion of the site. Sample data was used to indicate if contaminant releases into the environment have impacted site media and to assess potential impacts to terrestrial biota that might utilize the site for food and/or habitat purposes.
HR-137Q-GP08	Surface soil and subsurface soil	Surface and subsurface soil samples were collected in the trench, between the western stream channel and the surface pit. Sample data was used to indicate if contaminant releases into the environment have impacted site media and to assess potential impacts to terrestrial biota that might utilize the site for food and/or habitat purposes.
HR-137Q-GP09	Surface soil and subsurface soil	Surface and subsurface soil samples were collected south of the trench and scattered debris, in the south-central portion of the site. Sample data was used to indicate if contaminant releases into the environment have impacted site media and to assess potential impacts to terrestrial biota that might utilize the site for food and/or habitat purposes.
HR-137Q-GP10	Surface soil and subsurface soil	Surface and subsurface soil samples were collected in the trench, between the western stream channel and the rusted truck body. Sample data was used to indicate if contaminant releases into the environment have impacted site media and to assess potential impacts to terrestrial biota that might utilize the site for food and/or habitat purposes.
HR-137Q-GP11	Surface soil and subsurface soil	Surface and subsurface soil samples were collected in the pit, within the trench. Sample data was used to determine if contaminant releases into the environment have impacted site media and to assess potential impacts to terrestrial biota that might utilize the site for food and/or habitat purposes.
HR-137Q-DEP01	Depositional soil	A depositional soil sample was collected to the west of the site investigation area, in a dry streambed west of the disturbed area and possible STB drums. Sample data was used to determine if contaminant releases into the environment have impacted site media, and to assess potential impacts to terrestrial biota that might utilize the site for food and/or habitat purposes.
HR-137Q-DEP02	Depositional Soil	A depositional soil sample was collected in the eastern dry streambed, south of the site investigation area, and up-slope of the trench and scattered debris. Sample data was used to determine if contaminant releases into the environment have impacted site media, and to assess potential impacts to terrestrial biota that might utilize the site for food and/or habitat purposes.
HR-137Q-DEP03	Depositional Soil	A depositional soil sample was collected in the eastern dry streambed, north of the trench. Sample data was used to determine if contaminant releases into the environment have impacted site media, and to assess potential impacts to terrestrial biota that might utilize the site for food and/or habitat purposes.
HR-137Q-DEP04	Depositional Soil	A depositional soil sample was collected in the western dry streambed, south of the trench. Sample data was used to determine if contaminant releases into the environment have impacted site media, and to assess potential impacts to terrestrial biota that might utilize the site for food and/or habitat purposes.

Table 2-1

Site Investigation Sampling Locations and Rationale
Former 81mm Mortar Range, Parcel 137Q-X
Fort McClellan, Calhoun County, Alabama

Sample Location	Sample Media	Sample Location Rationale
HR-137Q-DEP05	Depositional Soil	A depositional soil sample was collected in the western dry streambed, north of the trench. Sample data was used to determine if contaminant releases into the environment have impacted site media, and to assess potential impacts to terrestrial biota that might utilize the site for food and/or habitat purposes.
HR-137Q-DEP06	Depositional Soil	A depositional soil sample was collected in the northern portion of the site, after the convergence of the east and west dry streambeds. Sample data was used to determine if contaminant releases into the environment have impacted site media, and to assess potential impacts to terrestrial biota that might utilize the site for food and/or habitat purposes.



LEGEND

- UNIMPROVED ROADS AND PARKING
- PAVED ROADS AND PARKING
- BUILDING
- TOPOGRAPHIC CONTOURS (CONTOUR INTERVAL - 25 FOOT)
- TREES / TREELINE
- AREA OF INVESTIGATION
- SURFACE DRAINAGE / CREEK
- TRENCH WITH NUMEROUS SURFACE DEPRESSIONS THROUGHOUT
- SURFACE AND SUBSURFACE SOIL SAMPLE LOCATION
- MONITORING WELL / GROUNDWATER, SURFACE AND SUBSURFACE SOIL SAMPLE LOCATION
- DEPOSITIONAL SOIL SAMPLE LOCATION

APPROXIMATE LOCATION OF OBSERVED FEATURES

1. OLD RUSTED TRUCK WITH BULLET HOLES
2. TRENCH WITH EMPTY RUSTED STB DRUMS (3), POSSIBLE METAL SHOWER HEAD, AND ONE FOXHOLE
3. SEVERAL RUSTED 1-5 GALLON DRUMS (POSSIBLE GAS CANS AND STB DRUMS), SHOWER HEADS, AND THE BACK OF AN OLD TRUCK
4. 2 SURFACE DEPRESSIONS
5. SURFACE DEPRESSION WITH RUSTED METAL SHEET IN BOTTOM (APPEARS TO BE WALLS OF OLD TUB)
6. DISTURBED AREA
7. OLD ROAD RUNNING PARALLEL TO SECONDARY ROAD
8. 4 RUSTED DRUMS (SOME ARE CONSTRUCTED OF CORRUGATED STEEL) IN DIRT MOUND
9. RUSTED DRUM WEST OF DIRT MOUND
10. OLD RUSTED TRUCK BED AND DISTURBED AREA WITH MOUNDS AND DEPRESSIONS
11. PIT IN TRENCH WITH METAL IN BOTTOM

FIGURE 2-1
SAMPLE LOCATION MAP
IT SITE INVESTIGATION
FORMER 81mm MORTAR RANGE
PARCEL 137Q-X

U. S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
FORT McCLELLAN
CALHOUN COUNTY, ALABAMA
Contract No. DACA21-96-D-0018

IT CORPORATION
A Member of The IT Group

DWG. NO.: ...\796887es.605 | PROJ. NO.: 796887
INITIATOR: J. BOND | PROJ. MGR.: J. YACOUB
DRAFT. CHCK. BY: | ENGR. CHCK. BY: S. MORAN
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STARTING DATE: 10/31/02 | DRAWN BY: D. BOMAR
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A select number of samples were analyzed for the following additional parameters:

- Target compound list (TCL) volatile organic compounds (VOC) – EPA Method 8260B
- TCL semivolatile organic compounds (SVOC) – EPA Method 8270C
- Chlorinated herbicides – EPA Method 8151A
- Chlorinated pesticides – EPA Method 8081A
- Organophosphorus pesticides – EPA Method 8141A.

Environmental sampling at Parcel 137Q-X was performed following procedures outlined in the SI SFSP (IT, 2002c) and in conjunction with the SSHP as attachments to the SAP (IT, 2000a, 2002a). The monitoring wells were installed and developed as described in the SAP. The lithological logs and well construction logs are included in Appendix A. Table 1-1 summarizes construction details of the monitoring wells installed at the site. Well development logs are included in Appendix C. Table 2-2 summarizes the groundwater field parameters.

Sample locations were surveyed using global positioning system (GPS) and conventional civil survey techniques described in the SAP. Horizontal coordinates were referenced to the U.S. State Plane Coordinate System, Alabama East Zone, North American Datum of 1983. Elevations were referenced to the North American Vertical Datum of 1988. Horizontal coordinates and elevations are included in Appendix D.

Two variances to the SFSP were recorded during the completion of the SI at the Former 81mm Mortar Range, Parcel 137Q-X. These variances did not alter the intent of the investigation or the sampling rationale presented in the SFSP. The variances to the SFSP are summarized in Table 2-3, and the variance reports are included in Appendix E.

2.1.2 Summary of Analytical Results

The results of the chemical analyses of samples collected at the Former 81mm Mortar Range, Parcel 137Q-X, indicate that metals, VOCs, pesticides, three herbicides, and two explosives were detected in the various site media. SVOCs were not detected in any of the samples collected. To evaluate the nature and extent of contamination at the site, the analytical results were compared to human health site-specific screening levels (SSSL), ecological screening values (ESV), and background screening values for FTMC. The SSSLs and ESVs were developed by IT as part of the human health and ecological risk evaluations associated with SIs being performed under the BRAC Environmental Restoration Program at FTMC. The SSSLs and ESVs are presented in the *Final Human Health and Ecological Screening Values and PAH Background Summary Report*

Table 2-2

Groundwater Field Parameters
Former 81mm Mortar Range, Parcel 137Q-X
Fort McClellan, Calhoun County, Alabama

Sample Location	Sample Date	Medium	Specific Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	ORP (mV)	Temperature (°C)	Turbidity (NTU)	pH (SU)
HR-137Q-MW01	10-Jul-02	GW	0.06	4.12	-37	18.80	>1000	6.44
HR-137Q-MW02	8-Jul-02	GW	0.03	4.22	238	17.36	31.0	5.15
HR-137Q-MW04	12-Jul-02	GW	0.02	8.97	224	18.87	223.0	5.65

°C - Degrees Celsius.
GW - Groundwater.
mg/L - Milligrams per liter.
mS/cm - Millisiemens per centimeter.
mV - Millivolts.
NTU - Nephelometric turbidity units.
ORP - Oxidation-reduction potential.
SU - Standard units.

Table 2-3

Variances to the Site-Specific Field Sampling Plan
Former 81mm Mortar Range, Parcel 137Q-X
Fort McClellan, Calhoun County, Alabama

Variance to the SFSP	Justification for Variance	Impact to Investigation
Permanent residuum monitoring well HR-137Q-MW03 was moved approximately 80 feet northwest of direct-push location HR-137Q-MW03. A groundwater sample was not collected from monitoring well HR-137Q-MW03.	Monitoring well HR-137Q-MW03 was not installed at its proposed location because competent bedrock was encountered at 22 feet bgs without groundwater present. The monitoring well was relocated; however, competent bedrock was encountered at 25 feet bgs and groundwater was not present.	None. The sample location is currently being monitored for the presence of groundwater. Should the well contain groundwater, a sample will be collected for chemical analysis; however, the remaining wells installed at the site provided sufficent information to characterize the site.
Surface water sample locations HR-137Q-SW/SD01 through HR-137Q-SW/SD05 were collected as depositional soil samples HR-137Q-DEP02 through HR-137Q-DEP06.	Surface water was not present during sampling activities; therefore, the surface water and sediment samples were collected as depositional soil samples.	None. Depositional soil samples were collected instead of surface water and sediment samples.

bgs - Below ground surface.
SFSP - Site-specific field sampling plan.
SI - Site Investigation.

(IT, 2000b). Background metals screening values are presented in the *Final Background Metals Survey Report, Fort McClellan, Alabama* (Science Applications International Corporation, 1998). Summary statistics for background metals samples collected at FTMC are included in Appendix F.

The following sections and Tables 2-4 through 2-6 summarize the results of the comparison of the detected constituents to the SSSLs, ESVs, and background screening values. Complete analytical data are presented in Appendix G. The data validation results are summarized in a quality assurance report, which includes the data validation summary report (Appendix H).

2.1.2.1 Surface and Depositional Analytical Results

Fifteen surface soil samples and six depositional soil samples were collected at the Former 81mm Mortar Range, Parcel 137Q-X. Surface and depositional soil samples were collected from the uppermost foot of soil at the locations shown on Figure 2-1. Analytical results were compared to residential human health SSSLs, ESVs, and metals background screening values, as presented in Table 2-4.

Metals. A total of 21 metals were detected in the surface and depositional soil samples collected at the site. The concentrations of seven metals (aluminum, antimony, arsenic, iron, lead, manganese, and thallium) exceeded SSSLs. Of these, only antimony (at two locations) and lead (seven locations) also exceeded their respective background values. The antimony and lead results also exceeded their respective upper background ranges:

- Antimony (5.21 and 5.69 milligrams per kilogram [mg/kg]) exceeded its SSSL (3.11 mg/kg) and upper background range (2.6 mg/kg) at two sample locations (HR-137Q-MW01 and HR-137Q-GP04).

- Lead (442 to 3,460 mg/kg) exceeded its SSSL (400 mg/kg) and upper background range (83 mg/kg) at seven sample locations (HR-137Q-DEP05, HR-137Q-GP04, HR-137Q-GP06, HR-137Q-GP08, HR-137Q-MW01, HR-137Q-MW03, HR-137Q-MW04).

Twelve metals were detected at concentrations exceeding ESVs. Of these, antimony (2 locations), beryllium (1 location), cobalt (1 location), copper (6 locations), lead (15 locations), mercury (1 location), and selenium (1 location) also exceeded their respective background concentrations; however, these metals results were within their respective upper background ranges, except for the following:

Table 2-4

Surface and Depositional Soil Analytical Results
Former 81mm Mortar Range, Parcel 137Q-X
Fort McClellan, Calhoun County, Alabama

						Sample Location:	HR-137Q-DEP01					HR-137Q-DEP02						HR-137Q-DEP03					
						Sample Number:	RH0033					RH0035						RH0037					
						Sample Date:	22-Jul-02					22-Jul-02						22-Jul-02					
						Sample Depth (Feet):	0- 0.5					0- 0.5						0- 0.5					
Parameter	Units	UBR[a]	BKG[b]	SSSL[c]	ESV[c]	Result	Qual	>UBR	>BKG	>SSSL	>ESV	Result	Qual	>UBR	>BKG	>SSSL	>ESV	Result	Qual	>UBR	>BKG	>SSSL	>ESV
METALS																							
Aluminum	mg/kg	3.99E+04	1.63E+04	7.80E+03	5.00E+01	1.16E+04				YES	YES	2.97E+03					YES	4.04E+03					YES
Antimony	mg/kg	2.60E+00	1.99E+00	3.11E+00	3.50E+00	ND						ND						ND					
Arsenic	mg/kg	4.90E+01	1.37E+01	4.26E-01	1.00E+01	3.67E+00				YES		1.17E+00	B			YES		2.60E+00				YES	
Barium	mg/kg	2.88E+02	1.24E+02	5.47E+02	1.65E+02	6.33E+01						3.53E+01						4.45E+01					
Beryllium	mg/kg	8.70E-01	8.00E-01	9.60E+00	1.10E+00	1.14E+00	J	YES	YES		YES	ND						ND					
Calcium	mg/kg	1.79E+04	1.72E+03	NA	NA	2.64E+02						9.97E+01	J					8.17E+01	J				
Chromium	mg/kg	1.34E+02	3.70E+01	2.32E+01	4.00E-01	8.07E+00					YES	3.30E+00					YES	8.01E+00					YES
Cobalt	mg/kg	7.10E+01	1.52E+01	4.68E+02	2.00E+01	2.17E+01			YES		YES	2.54E+00						2.60E+00					
Copper	mg/kg	2.40E+01	1.27E+01	3.13E+02	4.00E+01	6.51E+00						7.22E+00						4.68E+00					
Iron	mg/kg	5.63E+04	3.42E+04	2.34E+03	2.00E+02	7.30E+03	J			YES	YES	4.89E+03	J			YES	YES	9.92E+03	J			YES	YES
Lead	mg/kg	8.30E+01	4.01E+01	4.00E+02	5.00E+01	1.44E+02		YES	YES		YES	2.61E+01						2.00E+01					
Magnesium	mg/kg	9.60E+03	1.03E+03	NA	4.40E+05	3.57E+02						1.36E+02						1.46E+02					
Manganese	mg/kg	6.85E+03	1.58E+03	3.63E+02	1.00E+02	3.69E+02				YES	YES	1.09E+02					YES	1.34E+02					YES
Mercury	mg/kg	3.20E-01	8.00E-02	2.33E+00	1.00E-01	9.62E-02	J		YES			3.41E-02	J					ND					
Nickel	mg/kg	2.20E+01	1.03E+01	1.54E+02	3.00E+01	4.30E+00						1.29E+00	J					2.00E+00	J				
Potassium	mg/kg	6.01E+03	8.00E+02	NA	NA	3.25E+02	B					4.82E+02	B					5.00E+02	B				
Selenium	mg/kg	1.30E+00	4.80E-01	3.91E+01	8.10E-01	1.21E+00	J		YES		YES	ND						6.20E-01	J		YES		
Sodium	mg/kg	5.63E+02	6.34E+02	NA	NA	2.74E+01	J					2.47E+01	J					ND					
Thallium	mg/kg	3.40E+01	3.43E+00	5.08E-01	1.00E+00	ND						ND						ND					
Vanadium	mg/kg	1.58E+02	5.88E+01	5.31E+01	2.00E+00	1.29E+01					YES	5.14E+00					YES	1.10E+01					YES
Zinc	mg/kg	2.09E+02	4.06E+01	2.34E+03	5.00E+01	1.61E+01	J					4.54E+00	J					4.85E+00	J				
VOLATILE ORGANIC COMPOUNDS																							
2-Butanone	mg/kg	NA	NA	4.66E+03	8.96E+01	6.60E-02	J					NR						NR					
Acetone	mg/kg	NA	NA	7.76E+02	2.50E+00	1.20E+00	J					NR						NR					
Methylene chloride	mg/kg	NA	NA	8.41E+01	2.00E+00	ND						NR						NR					
Toluene	mg/kg	NA	NA	1.55E+03	5.00E-02	ND						NR						NR					
Trichlorofluoromethane	mg/kg	NA	NA	2.33E+03	1.00E-01	5.10E-03	J					NR						NR					
p-Cymene	mg/kg	NA	NA	1.55E+03	NA	ND						NR						NR					

Table 2-4

Surface and Depositional Soil Analytical Results
Former 81mm Mortar Range, Parcel 137Q-X
Fort McClellan, Calhoun County, Alabama

				Sample Location:		HR-137Q-DEP01						HR-137Q-DEP02						HR-137Q-DEP03					
				Sample Number:		RH0033						RH0035						RH0037					
				Sample Date:		22-Jul-02						22-Jul-02						22-Jul-02					
				Sample Depth (Feet):		0- 0.5						0- 0.5						0- 0.5					
Parameter	Units	UBR[a]	BKG[b]	SSSL[c]	ESV[c]	Result	Qual	>UBR	>BKG	>SSSL	>ESV	Result	Qual	>UBR	>BKG	>SSSL	>ESV	Result	Qual	>UBR	>BKG	>SSSL	>ESV
PESTICIDES																							
4,4'-DDD	mg/kg	NA	NA	2.54E+00	2.50E-03	ND						NR						NR					
4,4'-DDE	mg/kg	NA	NA	1.79E+00	2.50E-03	4.30E-03	J				YES	NR						NR					
4,4'-DDT	mg/kg	NA	NA	1.79E+00	2.50E-03	4.00E-03	J				YES	NR						NR					
Aldrin	mg/kg	NA	NA	3.65E-02	2.50E-03	1.40E-03	J					NR						NR					
Dieldrin	mg/kg	NA	NA	3.88E-02	5.00E-04	1.80E-03	J				YES	NR						NR					
Endosulfan I	mg/kg	NA	NA	4.66E+01	1.19E-01	ND						NR						NR					
Endrin	mg/kg	NA	NA	2.32E+00	1.00E-03	ND						NR						NR					
Endrin aldehyde	mg/kg	NA	NA	2.32E-01	1.05E-02	7.00E-03						NR						NR					
Heptachlor	mg/kg	NA	NA	1.40E-01	1.00E-01	1.90E-03	J					NR						NR					
Heptachlor epoxide	mg/kg	NA	NA	6.91E-02	1.52E-01	1.00E-03	J					NR						NR					
alpha-BHC	mg/kg	NA	NA	1.00E-01	2.50E-03	ND						NR						NR					
alpha-Chlordane	mg/kg	NA	NA	1.69E+00	1.00E-01	ND						NR						NR					
beta-BHC	mg/kg	NA	NA	3.50E-01	1.00E-03	1.20E-02	J				YES	NR						NR					
delta-BHC	mg/kg	NA	NA	2.33E+00	9.94E+00	ND						NR						NR					
gamma-BHC (Lindane)	mg/kg	NA	NA	4.85E-01	5.00E-05	ND						NR						NR					
gamma-Chlordane	mg/kg	NA	NA	1.69E+00	1.00E-01	ND						NR						NR					
HERBICIDES																							
2,2-Dichloropropanoic Acid	mg/kg	NA	NA	2.33E+02	1.00E-01	ND						NR						NR					
2,4-Dichllorophenoxy Acetic Acid	mg/kg	NA	NA	7.77E+01	1.00E-01	ND						NR						NR					
MCPP	mg/kg	NA	NA	7.77E+00	1.00E-01	ND						NR						NR					
EXPLOSIVES																							
1,3,5-Trinitrobenzene	mg/kg	NA	NA	2.32E+02	3.76E-01	ND						ND						ND					
4-Amino-2,6-dinitrotoluene	mg/kg	NA	NA	4.64E-01	NA	ND						ND						ND					

Table 2-4

Surface and Depositional Soil Analytical Results
Former 81mm Mortar Range, Parcel 137Q-X
Fort McClellan, Calhoun County, Alabama

						Sample Location:	HR-137Q-DEP04						HR-137Q-DEP05						HR-137Q-DEP06					
						Sample Number:	RH0038						RH0039						RH0040					
						Sample Date:	22-Jul-02						22-Jul-02						22-Jul-02					
						Sample Depth (Feet):	0- 0.5						0- 0.5						0- 0.5					
Parameter	Units	UBR[a]	BKG[b]	SSSL[c]	ESV[c]	Result	Qual	>UBR	>BKG	>SSSL	>ESV	Result	Qual	>UBR	>BKG	>SSSL	>ESV	Result	Qual	>UBR	>BKG	>SSSL	>ESV
METALS																							
Aluminum	mg/kg	3.99E+04	1.63E+04	7.80E+03	5.00E+01	1.13E+04				YES	YES	1.31E+04				YES	YES	1.99E+03					YES
Antimony	mg/kg	2.60E+00	1.99E+00	3.11E+00	3.50E+00	ND						ND						ND					
Arsenic	mg/kg	4.90E+01	1.37E+01	4.26E-01	1.00E+01	3.08E+00				YES		3.07E+00				YES		1.80E+00				YES	
Barium	mg/kg	2.88E+02	1.24E+02	5.47E+02	1.65E+02	3.41E+01						6.73E+01						4.23E+01					
Beryllium	mg/kg	8.70E-01	8.00E-01	9.60E+00	1.10E+00	ND						8.41E-01	J		YES			ND					
Calcium	mg/kg	1.79E+04	1.72E+03	NA	NA	1.35E+02						2.71E+02						5.06E+01	J				
Chromium	mg/kg	1.34E+02	3.70E+01	2.32E+01	4.00E-01	1.00E+01					YES	7.74E+00					YES	3.98E+00					YES
Cobalt	mg/kg	7.10E+01	1.52E+01	4.68E+02	2.00E+01	1.60E+00	J					9.51E+00						4.58E+00					
Copper	mg/kg	2.40E+01	1.27E+01	3.13E+02	4.00E+01	7.10E+00						4.84E+01		YES	YES		YES	3.20E+00					
Iron	mg/kg	5.63E+04	3.42E+04	2.34E+03	2.00E+02	9.80E+03	J			YES	YES	7.00E+03	J			YES	YES	6.81E+03	J			YES	YES
Lead	mg/kg	8.30E+01	4.01E+01	4.00E+02	5.00E+01	3.42E+01						4.42E+02		YES	YES	YES	YES	7.51E+00					
Magnesium	mg/kg	9.60E+03	1.03E+03	NA	4.40E+05	3.18E+02						4.08E+02						7.25E+01	J				
Manganese	mg/kg	6.85E+03	1.58E+03	3.63E+02	1.00E+02	4.87E+01						3.11E+02					YES	7.46E+02				YES	YES
Mercury	mg/kg	3.20E-01	8.00E-02	2.33E+00	1.00E-01	5.60E-02	J					1.02E-01	J		YES		YES	ND					
Nickel	mg/kg	2.20E+01	1.03E+01	1.54E+02	3.00E+01	2.72E+00						4.29E+00						2.12E+00					
Potassium	mg/kg	6.01E+03	8.00E+02	NA	NA	2.74E+02	B					4.00E+02	B					1.73E+02	B				
Selenium	mg/kg	1.30E+00	4.80E-01	3.91E+01	8.10E-01	5.50E-01	J		YES			7.72E-01	J		YES			5.25E-01	J		YES		
Sodium	mg/kg	5.63E+02	6.34E+02	NA	NA	2.16E+01	J					3.23E+01	J					1.87E+01	J				
Thallium	mg/kg	3.40E+01	3.43E+00	5.08E-01	1.00E+00	ND						ND						6.60E-01	J			YES	
Vanadium	mg/kg	1.58E+02	5.88E+01	5.31E+01	2.00E+00	1.78E+01					YES	1.34E+01					YES	5.59E+00					YES
Zinc	mg/kg	2.09E+02	4.06E+01	2.34E+03	5.00E+01	1.21E+01	J					1.86E+01	J					4.19E+00	J				
VOLATILE ORGANIC COMPOUNDS																							
2-Butanone	mg/kg	NA	NA	4.66E+03	8.96E+01	2.60E-02	J					NR						NR					
Acetone	mg/kg	NA	NA	7.76E+02	2.50E+00	1.10E+00	J					NR						NR					
Methylene chloride	mg/kg	NA	NA	8.41E+01	2.00E+00	ND						NR						NR					
Toluene	mg/kg	NA	NA	1.55E+03	5.00E-02	ND						NR						NR					
Trichlorofluoromethane	mg/kg	NA	NA	2.33E+03	1.00E-01	ND						NR						NR					
p-Cymene	mg/kg	NA	NA	1.55E+03	NA	ND						NR						NR					

Table 2-4

Surface and Depositional Soil Analytical Results
Former 81mm Mortar Range, Parcel 137Q-X
Fort McClellan, Calhoun County, Alabama

				Sample Location:		HR-137Q-DEP04						HR-137Q-DEP05						HR-137Q-DEP06					
				Sample Number:		RH0038						RH0039						RH0040					
				Sample Date:		22-Jul-02						22-Jul-02						22-Jul-02					
				Sample Depth (Feet):		0- 0.5						0- 0.5						0- 0.5					
Parameter	Units	UBR[a]	BKG[b]	SSSL[c]	ESV[c]	Result	Qual	>UBR	>BKG	>SSSL	>ESV	Result	Qual	>UBR	>BKG	>SSSL	>ESV	Result	Qual	>UBR	>BKG	>SSSL	>ESV
PESTICIDES																							
4,4'-DDD	mg/kg	NA	NA	2.54E+00	2.50E-03	2.70E-03	J				YES	NR						NR					
4,4'-DDE	mg/kg	NA	NA	1.79E+00	2.50E-03	2.20E-03	J					NR						NR					
4,4'-DDT	mg/kg	NA	NA	1.79E+00	2.50E-03	ND						NR						NR					
Aldrin	mg/kg	NA	NA	3.65E-02	2.50E-03	1.50E-03	J					NR						NR					
Dieldrin	mg/kg	NA	NA	3.88E-02	5.00E-04	ND						NR						NR					
Endosulfan I	mg/kg	NA	NA	4.66E+01	1.19E-01	ND						NR						NR					
Endrin	mg/kg	NA	NA	2.32E+00	1.00E-03	3.20E-03	J				YES	NR						NR					
Endrin aldehyde	mg/kg	NA	NA	2.32E-01	1.05E-02	ND						NR						NR					
Heptachlor	mg/kg	NA	NA	1.40E-01	1.00E-01	ND						NR						NR					
Heptachlor epoxide	mg/kg	NA	NA	6.91E-02	1.52E-01	ND						NR						NR					
alpha-BHC	mg/kg	NA	NA	1.00E-01	2.50E-03	1.20E-03	J					NR						NR					
alpha-Chlordane	mg/kg	NA	NA	1.69E+00	1.00E-01	ND						NR						NR					
beta-BHC	mg/kg	NA	NA	3.50E-01	1.00E-03	ND						NR						NR					
delta-BHC	mg/kg	NA	NA	2.33E+00	9.94E+00	ND						NR						NR					
gamma-BHC (Lindane)	mg/kg	NA	NA	4.85E-01	5.00E-05	7.30E-04	J				YES	NR						NR					
gamma-Chlordane	mg/kg	NA	NA	1.69E+00	1.00E-01	ND						NR						NR					
HERBICIDES																							
2,2-Dichloropropanoic Acid	mg/kg	NA	NA	2.33E+02	1.00E-01	ND						NR						NR					
2,4-Dichllorophenoxy Acetic Acid	mg/kg	NA	NA	7.77E+01	1.00E-01	1.20E-02						NR						NR					
MCPP	mg/kg	NA	NA	7.77E+00	1.00E-01	ND						NR						NR					
EXPLOSIVES																							
1,3,5-Trinitrobenzene	mg/kg	NA	NA	2.32E+02	3.76E-01	ND						ND						ND					
4-Amino-2,6-dinitrotoluene	mg/kg	NA	NA	4.64E-01	NA	ND						ND						ND					

Table 2-4

Surface and Depositional Soil Analytical Results
Former 81mm Mortar Range, Parcel 137Q-X
Fort McClellan, Calhoun County, Alabama

						Sample Location:	HR-137Q-GP01						HR-137Q-GP02						HR-137Q-GP03					
						Sample Number:	RH0001						RH0003						RH0005					
						Sample Date:	12-Jun-02						12-Jun-02						12-Jun-02					
						Sample Depth (Feet):	0- 1						0- 1						0- 1					
Parameter	Units	UBR[a]	BKG[b]	SSSL[c]	ESV[c]	Result	Qual	>UBR	>BKG	>SSSL	>ESV	Result	Qual	>UBR	>BKG	>SSSL	>ESV	Result	Qual	>UBR	>BKG	>SSSL	>ESV
METALS																							
Aluminum	mg/kg	3.99E+04	1.63E+04	7.80E+03	5.00E+01	4.83E+03					YES	7.13E+03					YES	5.25E+03					YES
Antimony	mg/kg	2.60E+00	1.99E+00	3.11E+00	3.50E+00	ND						ND						ND					
Arsenic	mg/kg	4.90E+01	1.37E+01	4.26E-01	1.00E+01	1.41E+00				YES		2.09E+00				YES		1.40E+00				YES	
Barium	mg/kg	2.88E+02	1.24E+02	5.47E+02	1.65E+02	1.66E+01						3.43E+01						1.77E+01					
Beryllium	mg/kg	8.70E-01	8.00E-01	9.60E+00	1.10E+00	ND						ND						ND					
Calcium	mg/kg	1.79E+04	1.72E+03	NA	NA	8.89E+01	J					1.01E+02	J					6.93E+01	J				
Chromium	mg/kg	1.34E+02	3.70E+01	2.32E+01	4.00E-01	3.72E+00	J				YES	6.68E+00	J				YES	3.84E+00	J				YES
Cobalt	mg/kg	7.10E+01	1.52E+01	4.68E+02	2.00E+01	1.71E+00	J					2.00E+00	J					ND					
Copper	mg/kg	2.40E+01	1.27E+01	3.13E+02	4.00E+01	3.69E+00						5.42E+00						1.90E+01			YES		
Iron	mg/kg	5.63E+04	3.42E+04	2.34E+03	2.00E+02	4.24E+03				YES	YES	6.98E+03				YES	YES	4.59E+03				YES	YES
Lead	mg/kg	8.30E+01	4.01E+01	4.00E+02	5.00E+01	4.11E+01	J		YES			5.89E+01	J		YES		YES	1.94E+02	J	YES	YES		YES
Magnesium	mg/kg	9.60E+03	1.03E+03	NA	4.40E+05	1.34E+02						2.24E+02						1.35E+02					
Manganese	mg/kg	6.85E+03	1.58E+03	3.63E+02	1.00E+02	5.93E+01						1.07E+02					YES	6.43E+01					
Mercury	mg/kg	3.20E-01	8.00E-02	2.33E+00	1.00E-01	ND						3.75E-02	J					ND					
Nickel	mg/kg	2.20E+01	1.03E+01	1.54E+02	3.00E+01	1.61E+00	J					1.78E+00	J					7.44E-01	J				
Potassium	mg/kg	6.01E+03	8.00E+02	NA	NA	1.25E+02	J					1.33E+02	J					1.02E+02	J				
Selenium	mg/kg	1.30E+00	4.80E-01	3.91E+01	8.10E-01	ND						ND						ND					
Sodium	mg/kg	5.63E+02	6.34E+02	NA	NA	4.48E+01	J					5.66E+01	J					4.54E+01	J				
Thallium	mg/kg	3.40E+01	3.43E+00	5.08E-01	1.00E+00	ND						ND						ND					
Vanadium	mg/kg	1.58E+02	5.88E+01	5.31E+01	2.00E+00	6.78E+00	J				YES	1.05E+01	J				YES	7.47E+00	J				YES
Zinc	mg/kg	2.09E+02	4.06E+01	2.34E+03	5.00E+01	1.25E+01	J					1.37E+01	J					9.93E+00	J				
VOLATILE ORGANIC COMPOUNDS																							
2-Butanone	mg/kg	NA	NA	4.66E+03	8.96E+01	NR						NR						NR					
Acetone	mg/kg	NA	NA	7.76E+02	2.50E+00	NR						NR						NR					
Methylene chloride	mg/kg	NA	NA	8.41E+01	2.00E+00	NR						NR						NR					
Toluene	mg/kg	NA	NA	1.55E+03	5.00E-02	NR						NR						NR					
Trichlorofluoromethane	mg/kg	NA	NA	2.33E+03	1.00E-01	NR						NR						NR					
p-Cymene	mg/kg	NA	NA	1.55E+03	NA	NR						NR						NR					

Table 2-4

Surface and Depositional Soil Analytical Results
Former 81mm Mortar Range, Parcel 137Q-X
Fort McClellan, Calhoun County, Alabama

				Sample Location:		HR-137Q-GP01						HR-137Q-GP02						HR-137Q-GP03					
				Sample Number:		RH0001						RH0003						RH0005					
				Sample Date:		12-Jun-02						12-Jun-02						12-Jun-02					
				Sample Depth (Feet):		0- 1						0- 1						0- 1					
Parameter	Units	UBR[a]	BKG[b]	SSSL[c]	ESV[c]	Result	Qual	>UBR	>BKG	>SSSL	>ESV	Result	Qual	>UBR	>BKG	>SSSL	>ESV	Result	Qual	>UBR	>BKG	>SSSL	>ESV
PESTICIDES																							
4,4'-DDD	mg/kg	NA	NA	2.54E+00	2.50E-03	NR						NR						NR					
4,4'-DDE	mg/kg	NA	NA	1.79E+00	2.50E-03	NR						NR						NR					
4,4'-DDT	mg/kg	NA	NA	1.79E+00	2.50E-03	NR						NR						NR					
Aldrin	mg/kg	NA	NA	3.65E-02	2.50E-03	NR						NR						NR					
Dieldrin	mg/kg	NA	NA	3.88E-02	5.00E-04	NR						NR						NR					
Endosulfan I	mg/kg	NA	NA	4.66E+01	1.19E-01	NR						NR						NR					
Endrin	mg/kg	NA	NA	2.32E+00	1.00E-03	NR						NR						NR					
Endrin aldehyde	mg/kg	NA	NA	2.32E-01	1.05E-02	NR						NR						NR					
Heptachlor	mg/kg	NA	NA	1.40E-01	1.00E-01	NR						NR						NR					
Heptachlor epoxide	mg/kg	NA	NA	6.91E-02	1.52E-01	NR						NR						NR					
alpha-BHC	mg/kg	NA	NA	1.00E-01	2.50E-03	NR						NR						NR					
alpha-Chlordane	mg/kg	NA	NA	1.69E+00	1.00E-01	NR						NR						NR					
beta-BHC	mg/kg	NA	NA	3.50E-01	1.00E-03	NR						NR						NR					
delta-BHC	mg/kg	NA	NA	2.33E+00	9.94E+00	NR						NR						NR					
gamma-BHC (Lindane)	mg/kg	NA	NA	4.85E-01	5.00E-05	NR						NR						NR					
gamma-Chlordane	mg/kg	NA	NA	1.69E+00	1.00E-01	NR						NR						NR					
HERBICIDES																							
2,2-Dichloropropanoic Acid	mg/kg	NA	NA	2.33E+02	1.00E-01	NR						NR						NR					
2,4-Dichllorophenoxy Acetic Acid	mg/kg	NA	NA	7.77E+01	1.00E-01	NR						NR						NR					
MCPP	mg/kg	NA	NA	7.77E+00	1.00E-01	NR						NR						NR					
EXPLOSIVES																							
1,3,5-Trinitrobenzene	mg/kg	NA	NA	2.32E+02	3.76E-01	ND						ND						ND					
4-Amino-2,6-dinitrotoluene	mg/kg	NA	NA	4.64E-01	NA	ND						ND						ND					

Table 2-4

Surface and Depositional Soil Analytical Results
Former 81mm Mortar Range, Parcel 137Q-X
Fort McClellan, Calhoun County, Alabama

						Sample Location:	HR-137Q-GP04						HR-137Q-GP05						HR-137Q-GP06					
						Sample Number:	RH0007						RH0009						RH0011					
						Sample Date:	18-Jun-02						18-Jun-02						18-Jun-02					
						Sample Depth (Feet):	0- 1						0- 1						0- 1					
Parameter	Units	UBR[a]	BKG[b]	SSSL[c]	ESV[c]	Result	Qual	>UBR	>BKG	>SSSL	>ESV	Result	Qual	>UBR	>BKG	>SSSL	>ESV	Result	Qual	>UBR	>BKG	>SSSL	>ESV
METALS																							
Aluminum	mg/kg	3.99E+04	1.63E+04	7.80E+03	5.00E+01	6.67E+03					YES	8.00E+03				YES	YES	8.43E+03				YES	YES
Antimony	mg/kg	2.60E+00	1.99E+00	3.11E+00	3.50E+00	5.69E+00	J	YES	YES	YES	YES	ND						ND					
Arsenic	mg/kg	4.90E+01	1.37E+01	4.26E-01	1.00E+01	2.52E+00				YES		1.65E+00				YES		1.68E+00				YES	
Barium	mg/kg	2.88E+02	1.24E+02	5.47E+02	1.65E+02	6.31E+01						3.32E+01						2.92E+01					
Beryllium	mg/kg	8.70E-01	8.00E-01	9.60E+00	1.10E+00	ND						ND						ND					
Calcium	mg/kg	1.79E+04	1.72E+03	NA	NA	2.02E+02						6.92E+01	J					1.09E+02					
Chromium	mg/kg	1.34E+02	3.70E+01	2.32E+01	4.00E-01	5.21E+00					YES	4.33E+00					YES	4.26E+00					YES
Cobalt	mg/kg	7.10E+01	1.52E+01	4.68E+02	2.00E+01	1.88E+00	J					3.06E+00						1.65E+00	J				
Copper	mg/kg	2.40E+01	1.27E+01	3.13E+02	4.00E+01	1.78E+02		YES	YES		YES	2.63E+00						5.40E+01		YES	YES		YES
Iron	mg/kg	5.63E+04	3.42E+04	2.34E+03	2.00E+02	6.14E+03	J			YES	YES	4.11E+03	J			YES	YES	6.31E+03	J			YES	YES
Lead	mg/kg	8.30E+01	4.01E+01	4.00E+02	5.00E+01	3.46E+03	J	YES	YES	YES	YES	1.12E+01	J					6.32E+02	J	YES	YES	YES	YES
Magnesium	mg/kg	9.60E+03	1.03E+03	NA	4.40E+05	2.43E+02						3.25E+02						2.87E+02					
Manganese	mg/kg	6.85E+03	1.58E+03	3.63E+02	1.00E+02	1.52E+02					YES	6.46E+01						3.20E+01					
Mercury	mg/kg	3.20E-01	8.00E-02	2.33E+00	1.00E-01	3.24E-02	J					3.94E-02	J					4.25E-02	J				
Nickel	mg/kg	2.20E+01	1.03E+01	1.54E+02	3.00E+01	2.69E+00						3.08E+00						2.56E+00					
Potassium	mg/kg	6.01E+03	8.00E+02	NA	NA	3.06E+02	J					1.96E+02	J					1.89E+02	J				
Selenium	mg/kg	1.30E+00	4.80E-01	3.91E+01	8.10E-01	ND						ND						ND					
Sodium	mg/kg	5.63E+02	6.34E+02	NA	NA	ND						5.36E+01	J					5.11E+01	J				
Thallium	mg/kg	3.40E+01	3.43E+00	5.08E-01	1.00E+00	ND						ND						ND					
Vanadium	mg/kg	1.58E+02	5.88E+01	5.31E+01	2.00E+00	8.17E+00					YES	8.50E+00					YES	1.00E+01					YES
Zinc	mg/kg	2.09E+02	4.06E+01	2.34E+03	5.00E+01	4.20E+01			YES			1.43E+01						3.31E+01					
VOLATILE ORGANIC COMPOUNDS																							
2-Butanone	mg/kg	NA	NA	4.66E+03	8.96E+01	ND						NR						NR					
Acetone	mg/kg	NA	NA	7.76E+02	2.50E+00	1.50E-01	J					NR						NR					
Methylene chloride	mg/kg	NA	NA	8.41E+01	2.00E+00	ND						NR						NR					
Toluene	mg/kg	NA	NA	1.55E+03	5.00E-02	ND						NR						NR					
Trichlorofluoromethane	mg/kg	NA	NA	2.33E+03	1.00E-01	ND						NR						NR					
p-Cymene	mg/kg	NA	NA	1.55E+03	NA	ND						NR						NR					

Table 2-4

Surface and Depositional Soil Analytical Results
Former 81mm Mortar Range, Parcel 137Q-X
Fort McClellan, Calhoun County, Alabama

						Sample Location:						HR-137Q-GP04						HR-137Q-GP05						HR-137Q-GP06					
						Sample Number:						RH0007						RH0009						RH0011					
						Sample Date:						18-Jun-02						18-Jun-02						18-Jun-02					
						Sample Depth (Feet):						0- 1						0- 1						0- 1					
Parameter	Units	UBR[a]	BKG[b]	SSSL[c]	ESV[c]	Result	Qual	>UBR	>BKG	>SSSL	>ESV	Result	Qual	>UBR	>BKG	>SSSL	>ESV	Result	Qual	>UBR	>BKG	>SSSL	>ESV
PESTICIDES																													
4,4'-DDD	mg/kg	NA	NA	2.54E+00	2.50E-03	3.60E-03	J				YES	NR						NR					
4,4'-DDE	mg/kg	NA	NA	1.79E+00	2.50E-03	3.20E-03	J				YES	NR						NR					
4,4'-DDT	mg/kg	NA	NA	1.79E+00	2.50E-03	1.90E-03	J					NR						NR					
Aldrin	mg/kg	NA	NA	3.65E-02	2.50E-03	ND						NR						NR					
Dieldrin	mg/kg	NA	NA	3.88E-02	5.00E-04	ND						NR						NR					
Endosulfan I	mg/kg	NA	NA	4.66E+01	1.19E-01	ND						NR						NR					
Endrin	mg/kg	NA	NA	2.32E+00	1.00E-03	ND						NR						NR					
Endrin aldehyde	mg/kg	NA	NA	2.32E-01	1.05E-02	ND						NR						NR					
Heptachlor	mg/kg	NA	NA	1.40E-01	1.00E-01	ND						NR						NR					
Heptachlor epoxide	mg/kg	NA	NA	6.91E-02	1.52E-01	ND						NR						NR					
alpha-BHC	mg/kg	NA	NA	1.00E-01	2.50E-03	ND						NR						NR					
alpha-Chlordane	mg/kg	NA	NA	1.69E+00	1.00E-01	ND						NR						NR					
beta-BHC	mg/kg	NA	NA	3.50E-01	1.00E-03	7.60E-04	J					NR						NR					
delta-BHC	mg/kg	NA	NA	2.33E+00	9.94E+00	ND						NR						NR					
gamma-BHC (Lindane)	mg/kg	NA	NA	4.85E-01	5.00E-05	ND						NR						NR					
gamma-Chlordane	mg/kg	NA	NA	1.69E+00	1.00E-01	ND						NR						NR					
HERBICIDES																							
2,2-Dichloropropanoic Acid	mg/kg	NA	NA	2.33E+02	1.00E-01	ND						NR						NR					
2,4-Dichllorophenoxy Acetic Acid	mg/kg	NA	NA	7.77E+01	1.00E-01	ND						NR						NR					
MCPP	mg/kg	NA	NA	7.77E+00	1.00E-01	ND						NR						NR					
EXPLOSIVES																							
1,3,5-Trinitrobenzene	mg/kg	NA	NA	2.32E+02	3.76E-01	ND						ND						ND					
4-Amino-2,6-dinitrotoluene	mg/kg	NA	NA	4.64E-01	NA	ND						ND						ND					

Table 2-4

Surface and Depositional Soil Analytical Results
Former 81mm Mortar Range, Parcel 137Q-X
Fort McClellan, Calhoun County, Alabama

						Sample Location:	HR-137Q-GP07						HR-137Q-GP08						HR-137Q-GP09					
						Sample Number:	RH0013						RH0015						RH0017					
						Sample Date:	13-Jun-02						12-Jun-02						13-Jun-02					
						Sample Depth (Feet):	0- 1						0- 1						0- 1					
Parameter	Units	UBR[a]	BKG[b]	SSSL[c]	ESV[c]	Result	Qual	>UBR	>BKG	>SSSL	>ESV	Result	Qual	>UBR	>BKG	>SSSL	>ESV	Result	Qual	>UBR	>BKG	>SSSL	>ESV
METALS																							
Aluminum	mg/kg	3.99E+04	1.63E+04	7.80E+03	5.00E+01	3.92E+03					YES	5.55E+03					YES	9.78E+03				YES	YES
Antimony	mg/kg	2.60E+00	1.99E+00	3.11E+00	3.50E+00	ND						ND						ND					
Arsenic	mg/kg	4.90E+01	1.37E+01	4.26E-01	1.00E+01	1.45E+00				YES		1.14E+00				YES		3.07E+00				YES	
Barium	mg/kg	2.88E+02	1.24E+02	5.47E+02	1.65E+02	5.28E+01						2.76E+01						6.37E+01					
Beryllium	mg/kg	8.70E-01	8.00E-01	9.60E+00	1.10E+00	ND						ND						ND					
Calcium	mg/kg	1.79E+04	1.72E+03	NA	NA	1.42E+02						9.32E+01	J					2.32E+02					
Chromium	mg/kg	1.34E+02	3.70E+01	2.32E+01	4.00E-01	2.51E+00	J				YES	3.04E+00	J				YES	6.27E+00	J				YES
Cobalt	mg/kg	7.10E+01	1.52E+01	4.68E+02	2.00E+01	1.45E+00	J					ND						ND					
Copper	mg/kg	2.40E+01	1.27E+01	3.13E+02	4.00E+01	1.39E+01			YES			4.02E+01		YES	YES		YES	2.33E+01			YES		
Iron	mg/kg	5.63E+04	3.42E+04	2.34E+03	2.00E+02	3.16E+03				YES	YES	3.86E+03				YES	YES	6.72E+03				YES	YES
Lead	mg/kg	8.30E+01	4.01E+01	4.00E+02	5.00E+01	3.34E+02	J	YES	YES		YES	5.03E+02	J	YES	YES	YES	YES	3.80E+02	J	YES	YES		YES
Magnesium	mg/kg	9.60E+03	1.03E+03	NA	4.40E+05	1.07E+02	J					1.74E+02						2.34E+02					
Manganese	mg/kg	6.85E+03	1.58E+03	3.63E+02	1.00E+02	9.93E+01						3.98E+01						3.04E+01					
Mercury	mg/kg	3.20E-01	8.00E-02	2.33E+00	1.00E-01	6.15E-02	J					2.88E-02	J					5.87E-02	J				
Nickel	mg/kg	2.20E+01	1.03E+01	1.54E+02	3.00E+01	1.42E+00	J					1.57E+00	J					1.53E+00	J				
Potassium	mg/kg	6.01E+03	8.00E+02	NA	NA	1.62E+02	J					1.84E+02	J					2.12E+02	J				
Selenium	mg/kg	1.30E+00	4.80E-01	3.91E+01	8.10E-01	5.26E-01	J		YES			ND						ND					
Sodium	mg/kg	5.63E+02	6.34E+02	NA	NA	5.19E+01	J					5.13E+01	J					5.68E+01	J				
Thallium	mg/kg	3.40E+01	3.43E+00	5.08E-01	1.00E+00	ND						ND						ND					
Vanadium	mg/kg	1.58E+02	5.88E+01	5.31E+01	2.00E+00	4.69E+00	J				YES	6.29E+00	J				YES	1.31E+01	J				YES
Zinc	mg/kg	2.09E+02	4.06E+01	2.34E+03	5.00E+01	1.40E+01	J					1.30E+01	J					2.23E+01	J				
VOLATILE ORGANIC COMPOUNDS																							
2-Butanone	mg/kg	NA	NA	4.66E+03	8.96E+01	1.90E-02	J					ND						NR					
Acetone	mg/kg	NA	NA	7.76E+02	2.50E+00	4.30E-01	J					2.70E-01	J					NR					
Methylene chloride	mg/kg	NA	NA	8.41E+01	2.00E+00	ND						ND						NR					
Toluene	mg/kg	NA	NA	1.55E+03	5.00E-02	3.40E-03	J					ND						NR					
Trichlorofluoromethane	mg/kg	NA	NA	2.33E+03	1.00E-01	ND						ND						NR					
p-Cymene	mg/kg	NA	NA	1.55E+03	NA	5.40E-03	J					ND						NR					

Table 2-4

Surface and Depositional Soil Analytical Results
Former 81mm Mortar Range, Parcel 137Q-X
Fort McClellan, Calhoun County, Alabama

				Sample Location:		HR-137Q-GP07						HR-137Q-GP08						HR-137Q-GP09					
				Sample Number:		RH0013						RH0015						RH0017					
				Sample Date:		13-Jun-02						12-Jun-02						13-Jun-02					
				Sample Depth (Feet):		0- 1						0- 1						0- 1					
Parameter	Units	UBR[a]	BKG[b]	SSSL[c]	ESV[c]	Result	Qual	>UBR	>BKG	>SSSL	>ESV	Result	Qual	>UBR	>BKG	>SSSL	>ESV	Result	Qual	>UBR	>BKG	>SSSL	>ESV
PESTICIDES																							
4,4'-DDD	mg/kg	NA	NA	2.54E+00	2.50E-03	2.70E-03	J				YES	ND						NR					
4,4'-DDE	mg/kg	NA	NA	1.79E+00	2.50E-03	5.20E-03	J				YES	ND						NR					
4,4'-DDT	mg/kg	NA	NA	1.79E+00	2.50E-03	5.90E-03	J				YES	1.70E-03	J					NR					
Aldrin	mg/kg	NA	NA	3.65E-02	2.50E-03	ND						ND						NR					
Dieldrin	mg/kg	NA	NA	3.88E-02	5.00E-04	ND						ND						NR					
Endosulfan I	mg/kg	NA	NA	4.66E+01	1.19E-01	ND						ND						NR					
Endrin	mg/kg	NA	NA	2.32E+00	1.00E-03	1.80E-03	J				YES	ND						NR					
Endrin aldehyde	mg/kg	NA	NA	2.32E-01	1.05E-02	2.20E-03	J					8.90E-04	J					NR					
Heptachlor	mg/kg	NA	NA	1.40E-01	1.00E-01	ND						ND						NR					
Heptachlor epoxide	mg/kg	NA	NA	6.91E-02	1.52E-01	ND						3.60E-04	J					NR					
alpha-BHC	mg/kg	NA	NA	1.00E-01	2.50E-03	ND						1.10E-03	J					NR					
alpha-Chlordane	mg/kg	NA	NA	1.69E+00	1.00E-01	ND						ND						NR					
beta-BHC	mg/kg	NA	NA	3.50E-01	1.00E-03	3.60E-03					YES	ND						NR					
delta-BHC	mg/kg	NA	NA	2.33E+00	9.94E+00	ND						ND						NR					
gamma-BHC (Lindane)	mg/kg	NA	NA	4.85E-01	5.00E-05	6.00E-04	J				YES	8.80E-04	J				YES	NR					
gamma-Chlordane	mg/kg	NA	NA	1.69E+00	1.00E-01	ND						ND						NR					
HERBICIDES																							
2,2-Dichloropropanoic Acid	mg/kg	NA	NA	2.33E+02	1.00E-01	ND						9.50E-03	J					NR					
2,4-Dichllorophenoxy Acetic Acid	mg/kg	NA	NA	7.77E+01	1.00E-01	ND						ND						NR					
MCPP	mg/kg	NA	NA	7.77E+00	1.00E-01	ND						ND						NR					
EXPLOSIVES																							
1,3,5-Trinitrobenzene	mg/kg	NA	NA	2.32E+02	3.76E-01	ND						ND						ND					
4-Amino-2,6-dinitrotoluene	mg/kg	NA	NA	4.64E-01	NA	7.30E-02	J					ND						ND					

Table 2-4

Surface and Depositional Soil Analytical Results
Former 81mm Mortar Range, Parcel 137Q-X
Fort McClellan, Calhoun County, Alabama

						Sample Location:	HR-137Q-GP10						HR-137Q-GP11						HR-137Q-MW01					
						Sample Number:	RH0019						RH0021						RH0023					
						Sample Date:	13-Jun-02						12-Jun-02						11-Jun-02					
						Sample Depth (Feet):	0- 1						0- 1						0- 1					
Parameter	Units	UBR[a]	BKG[b]	SSSL[c]	ESV[c]	Result	Qual	>UBR	>BKG	>SSSL	>ESV	Result	Qual	>UBR	>BKG	>SSSL	>ESV	Result	Qual	>UBR	>BKG	>SSSL	>ESV
METALS																							
Aluminum	mg/kg	3.99E+04	1.63E+04	7.80E+03	5.00E+01	5.84E+03					YES	6.97E+03					YES	5.72E+03					YES
Antimony	mg/kg	2.60E+00	1.99E+00	3.11E+00	3.50E+00	ND						ND						5.21E+00	J	YES	YES	YES	YES
Arsenic	mg/kg	4.90E+01	1.37E+01	4.26E-01	1.00E+01	1.29E+00				YES		1.87E+00				YES		1.77E+00				YES	
Barium	mg/kg	2.88E+02	1.24E+02	5.47E+02	1.65E+02	1.95E+01						6.22E+01						9.85E+01	J				
Beryllium	mg/kg	8.70E-01	8.00E-01	9.60E+00	1.10E+00	ND						ND						ND					
Calcium	mg/kg	1.79E+04	1.72E+03	NA	NA	1.03E+02	J					1.09E+03						4.76E+02					
Chromium	mg/kg	1.34E+02	3.70E+01	2.32E+01	4.00E-01	2.48E+00	J				YES	5.87E+00	J				YES	4.31E+00					YES
Cobalt	mg/kg	7.10E+01	1.52E+01	4.68E+02	2.00E+01	ND						ND						1.95E+00	J				
Copper	mg/kg	2.40E+01	1.27E+01	3.13E+02	4.00E+01	4.61E+00						3.48E+01		YES	YES			3.15E+01		YES	YES		
Iron	mg/kg	5.63E+04	3.42E+04	2.34E+03	2.00E+02	2.58E+03				YES	YES	6.22E+03				YES	YES	6.39E+03				YES	YES
Lead	mg/kg	8.30E+01	4.01E+01	4.00E+02	5.00E+01	6.14E+01	J		YES		YES	3.82E+02	J	YES	YES		YES	7.17E+02		YES	YES	YES	YES
Magnesium	mg/kg	9.60E+03	1.03E+03	NA	4.40E+05	1.57E+02						2.70E+02						2.96E+02					
Manganese	mg/kg	6.85E+03	1.58E+03	3.63E+02	1.00E+02	1.01E+01						1.03E+02					YES	1.44E+02					YES
Mercury	mg/kg	3.20E-01	8.00E-02	2.33E+00	1.00E-01	3.45E-02	J					8.91E-02	J		YES			4.92E-02	J				
Nickel	mg/kg	2.20E+01	1.03E+01	1.54E+02	3.00E+01	1.65E+00	J					1.84E+00	J					1.77E+00	B				
Potassium	mg/kg	6.01E+03	8.00E+02	NA	NA	1.35E+02	J					3.44E+02	J					5.82E+02					
Selenium	mg/kg	1.30E+00	4.80E-01	3.91E+01	8.10E-01	ND						6.16E-01	J		YES			ND					
Sodium	mg/kg	5.63E+02	6.34E+02	NA	NA	5.60E+01	J					5.42E+01	J					5.67E+01	J				
Thallium	mg/kg	3.40E+01	3.43E+00	5.08E-01	1.00E+00	ND						ND						ND					
Vanadium	mg/kg	1.58E+02	5.88E+01	5.31E+01	2.00E+00	5.22E+00	J				YES	9.57E+00	J				YES	8.20E+00					YES
Zinc	mg/kg	2.09E+02	4.06E+01	2.34E+03	5.00E+01	8.73E+00	J					1.90E+01	J					1.61E+01	J				
VOLATILE ORGANIC COMPOUNDS																							
2-Butanone	mg/kg	NA	NA	4.66E+03	8.96E+01	ND						3.20E-02	J					ND					
Acetone	mg/kg	NA	NA	7.76E+02	2.50E+00	3.30E-01	J					6.50E-01	J					3.30E-01	J				
Methylene chloride	mg/kg	NA	NA	8.41E+01	2.00E+00	ND						3.40E-03	B					ND					
Toluene	mg/kg	NA	NA	1.55E+03	5.00E-02	2.10E-03	J					3.00E-03	J					ND					
Trichlorofluoromethane	mg/kg	NA	NA	2.33E+03	1.00E-01	ND						ND						ND					
p-Cymene	mg/kg	NA	NA	1.55E+03	NA	5.30E-02	UJ					1.20E-02	J					4.40E-03	J				

Table 2-4

Surface and Depositional Soil Analytical Results
Former 81mm Mortar Range, Parcel 137Q-X
Fort McClellan, Calhoun County, Alabama

				Sample Location:		HR-137Q-GP10						HR-137Q-GP11						HR-137Q-MW01					
				Sample Number:		RH0019						RH0021						RH0023					
				Sample Date:		13-Jun-02						12-Jun-02						11-Jun-02					
				Sample Depth (Feet):		0- 1						0- 1						0- 1					
Parameter	Units	UBR[a]	BKG[b]	SSSL[c]	ESV[c]	Result	Qual	>UBR	>BKG	>SSSL	>ESV	Result	Qual	>UBR	>BKG	>SSSL	>ESV	Result	Qual	>UBR	>BKG	>SSSL	>ESV
PESTICIDES																							
4,4'-DDD	mg/kg	NA	NA	2.54E+00	2.50E-03	ND						6.90E-03	J				YES	8.30E-03	J				YES
4,4'-DDE	mg/kg	NA	NA	1.79E+00	2.50E-03	3.20E-03	J				YES	1.10E-02					YES	5.40E-03	J				YES
4,4'-DDT	mg/kg	NA	NA	1.79E+00	2.50E-03	6.00E-03	J				YES	4.90E-03	J				YES	ND					
Aldrin	mg/kg	NA	NA	3.65E-02	2.50E-03	1.30E-03	J					1.30E-03	J					ND					
Dieldrin	mg/kg	NA	NA	3.88E-02	5.00E-04	8.40E-04	J				YES	1.70E-03	J				YES	ND					
Endosulfan I	mg/kg	NA	NA	4.66E+01	1.19E-01	ND						2.00E-03	J					ND					
Endrin	mg/kg	NA	NA	2.32E+00	1.00E-03	2.10E-03	J				YES	3.10E-03	J				YES	ND					
Endrin aldehyde	mg/kg	NA	NA	2.32E-01	1.05E-02	ND						6.90E-03						ND					
Heptachlor	mg/kg	NA	NA	1.40E-01	1.00E-01	5.70E-04	J					1.50E-03	J					ND					
Heptachlor epoxide	mg/kg	NA	NA	6.91E-02	1.52E-01	ND						1.30E-03	J					ND					
alpha-BHC	mg/kg	NA	NA	1.00E-01	2.50E-03	1.20E-03	J					ND						ND					
alpha-Chlordane	mg/kg	NA	NA	1.69E+00	1.00E-01	1.40E-03	J					1.10E-03	J					ND					
beta-BHC	mg/kg	NA	NA	3.50E-01	1.00E-03	2.50E-03					YES	ND						2.30E-03	J				YES
delta-BHC	mg/kg	NA	NA	2.33E+00	9.94E+00	1.00E-03	J					8.00E-03	J					1.80E-03	J				
gamma-BHC (Lindane)	mg/kg	NA	NA	4.85E-01	5.00E-05	7.80E-04	J				YES	ND						ND					
gamma-Chlordane	mg/kg	NA	NA	1.69E+00	1.00E-01	ND						1.10E-03	J					ND					
HERBICIDES																							
2,2-Dichloropropanoic Acid	mg/kg	NA	NA	2.33E+02	1.00E-01	ND						ND						ND					
2,4-Dichllorophenoxy Acetic Acid	mg/kg	NA	NA	7.77E+01	1.00E-01	ND						1.30E-02	J					ND					
MCPP	mg/kg	NA	NA	7.77E+00	1.00E-01	1.50E+00	J				YES	1.60E+00	J				YES	ND					
EXPLOSIVES																							
1,3,5-Trinitrobenzene	mg/kg	NA	NA	2.32E+02	3.76E-01	ND						1.00E+00					YES	ND					
4-Amino-2,6-dinitrotoluene	mg/kg	NA	NA	4.64E-01	NA	ND						ND						ND					

Table 2-4

Surface and Depositional Soil Analytical Results
Former 81mm Mortar Range, Parcel 137Q-X
Fort McClellan, Calhoun County, Alabama

						Sample Location:	HR-137Q-MW02						HR-137Q-MW03						HR-137Q-MW04					
						Sample Number:	RH0026						RH0029						RH0031					
						Sample Date:	11-Jun-02						12-Jun-02						10-Jun-02					
						Sample Depth (Feet):	0- 1						0- 1						0- 1					
Parameter	Units	UBR[a]	BKG[b]	SSSL[c]	ESV[c]	Result	Qual	>UBR	>BKG	>SSSL	>ESV	Result	Qual	>UBR	>BKG	>SSSL	>ESV	Result	Qual	>UBR	>BKG	>SSSL	>ESV
METALS																							
Aluminum	mg/kg	3.99E+04	1.63E+04	7.80E+03	5.00E+01	6.06E+03					YES	4.59E+03					YES	8.93E+03				YES	YES
Antimony	mg/kg	2.60E+00	1.99E+00	3.11E+00	3.50E+00	ND						ND						ND					
Arsenic	mg/kg	4.90E+01	1.37E+01	4.26E-01	1.00E+01	2.46E+00				YES		1.74E+00				YES		2.33E+00				YES	
Barium	mg/kg	2.88E+02	1.24E+02	5.47E+02	1.65E+02	5.00E+01	J					4.31E+01						4.89E+01	J				
Beryllium	mg/kg	8.70E-01	8.00E-01	9.60E+00	1.10E+00	ND						ND						ND					
Calcium	mg/kg	1.79E+04	1.72E+03	NA	NA	1.11E+03						1.50E+02						1.22E+02					
Chromium	mg/kg	1.34E+02	3.70E+01	2.32E+01	4.00E-01	1.92E+01					YES	2.76E+00	J				YES	5.71E+00					YES
Cobalt	mg/kg	7.10E+01	1.52E+01	4.68E+02	2.00E+01	2.70E+00						ND						ND					
Copper	mg/kg	2.40E+01	1.27E+01	3.13E+02	4.00E+01	2.18E+01			YES			1.34E+02		YES	YES		YES	1.44E+02		YES	YES		YES
Iron	mg/kg	5.63E+04	3.42E+04	2.34E+03	2.00E+02	1.27E+04				YES	YES	3.18E+03				YES	YES	5.84E+03				YES	YES
Lead	mg/kg	8.30E+01	4.01E+01	4.00E+02	5.00E+01	3.94E+02		YES	YES		YES	1.71E+03	J	YES	YES	YES	YES	2.33E+03		YES	YES	YES	YES
Magnesium	mg/kg	9.60E+03	1.03E+03	NA	4.40E+05	7.06E+02						1.68E+02						2.36E+02					
Manganese	mg/kg	6.85E+03	1.58E+03	3.63E+02	1.00E+02	2.16E+02					YES	7.35E+01						8.25E+01					
Mercury	mg/kg	3.20E-01	8.00E-02	2.33E+00	1.00E-01	6.12E-02	J					4.31E-02	J					7.16E-02	J				
Nickel	mg/kg	2.20E+01	1.03E+01	1.54E+02	3.00E+01	1.44E+00	B					1.43E+00	J					2.01E+00	B				
Potassium	mg/kg	6.01E+03	8.00E+02	NA	NA	1.94E+02	J					2.09E+02	J					1.46E+02	J				
Selenium	mg/kg	1.30E+00	4.80E-01	3.91E+01	8.10E-01	ND						ND						ND					
Sodium	mg/kg	5.63E+02	6.34E+02	NA	NA	5.01E+01	J					4.49E+01	J					4.52E+01	J				
Thallium	mg/kg	3.40E+01	3.43E+00	5.08E-01	1.00E+00	ND						ND						ND					
Vanadium	mg/kg	1.58E+02	5.88E+01	5.31E+01	2.00E+00	1.34E+01					YES	5.47E+00	J				YES	1.12E+01					YES
Zinc	mg/kg	2.09E+02	4.06E+01	2.34E+03	5.00E+01	1.46E+01	J					1.58E+01	J					3.28E+01	J				
VOLATILE ORGANIC COMPOUNDS																							
2-Butanone	mg/kg	NA	NA	4.66E+03	8.96E+01	ND						1.70E-02	J					ND					
Acetone	mg/kg	NA	NA	7.76E+02	2.50E+00	3.70E-01	J					5.10E-01	J					2.10E-01	J				
Methylene chloride	mg/kg	NA	NA	8.41E+01	2.00E+00	ND						1.80E-03	B					ND					
Toluene	mg/kg	NA	NA	1.55E+03	5.00E-02	ND						ND						ND					
Trichlorofluoromethane	mg/kg	NA	NA	2.33E+03	1.00E-01	ND						ND						ND					
p-Cymene	mg/kg	NA	NA	1.55E+03	NA	ND						ND						4.90E-03	J				

Table 2-4

Surface and Depositional Soil Analytical Results
Former 81mm Mortar Range, Parcel 137Q-X
Fort McClellan, Calhoun County, Alabama

				Sample Location:		HR-137Q-MW02						HR-137Q-MW03						HR-137Q-MW04					
				Sample Number:		RH0026						RH0029						RH0031					
				Sample Date:		11-Jun-02						12-Jun-02						10-Jun-02					
				Sample Depth (Feet):		0- 1						0- 1						0- 1					
Parameter	Units	UBR[a]	BKG[b]	SSSL[c]	ESV[c]	Result	Qual	>UBR	>BKG	>SSSL	>ESV	Result	Qual	>UBR	>BKG	>SSSL	>ESV	Result	Qual	>UBR	>BKG	>SSSL	>ESV
PESTICIDES																							
4,4'-DDD	mg/kg	NA	NA	2.54E+00	2.50E-03	ND						4.40E-03	J				YES	ND					
4,4'-DDE	mg/kg	NA	NA	1.79E+00	2.50E-03	ND						3.20E-03	J				YES	4.20E-03	J				YES
4,4'-DDT	mg/kg	NA	NA	1.79E+00	2.50E-03	ND						ND						ND					
Aldrin	mg/kg	NA	NA	3.65E-02	2.50E-03	ND						ND						ND					
Dieldrin	mg/kg	NA	NA	3.88E-02	5.00E-04	ND						1.00E-03	J				YES	ND					
Endosulfan I	mg/kg	NA	NA	4.66E+01	1.19E-01	ND						ND						ND					
Endrin	mg/kg	NA	NA	2.32E+00	1.00E-03	ND						1.60E-03	J				YES	ND					
Endrin aldehyde	mg/kg	NA	NA	2.32E-01	1.05E-02	ND						3.00E-03	J					ND					
Heptachlor	mg/kg	NA	NA	1.40E-01	1.00E-01	ND						1.60E-03	J					ND					
Heptachlor epoxide	mg/kg	NA	NA	6.91E-02	1.52E-01	ND						8.10E-04	J					ND					
alpha-BHC	mg/kg	NA	NA	1.00E-01	2.50E-03	ND						ND						ND					
alpha-Chlordane	mg/kg	NA	NA	1.69E+00	1.00E-01	ND						ND						ND					
beta-BHC	mg/kg	NA	NA	3.50E-01	1.00E-03	ND						ND						2.20E-03					YES
delta-BHC	mg/kg	NA	NA	2.33E+00	9.94E+00	ND						ND						ND					
gamma-BHC (Lindane)	mg/kg	NA	NA	4.85E-01	5.00E-05	ND						ND						ND					
gamma-Chlordane	mg/kg	NA	NA	1.69E+00	1.00E-01	ND						6.00E-04	J					ND					
HERBICIDES																							
2,2-Dichloropropanoic Acid	mg/kg	NA	NA	2.33E+02	1.00E-01	ND						6.60E-03	J					ND					
2,4-Dichllorophenoxy Acetic Acid	mg/kg	NA	NA	7.77E+01	1.00E-01	ND						ND						ND					
MCPP	mg/kg	NA	NA	7.77E+00	1.00E-01	ND						ND						1.50E+00	J				YES
EXPLOSIVES																							
1,3,5-Trinitrobenzene	mg/kg	NA	NA	2.32E+02	3.76E-01	ND						ND						ND					
4-Amino-2,6-dinitrotoluene	mg/kg	NA	NA	4.64E-01	NA	ND						ND						ND					

Analyses performed using U.S. Environmental Protection Agency (EPA) SW-846 analytical methods.

[a] UBR - Upper background range as given in Science Applications International Corporation (SAIC), 1998, *Final Background Metals Survey Report, Fort McClellan, Alabama*, July.

[b] BKG - Background. Concentration listed is two times (2x) the arithmetic mean of background metals concentration given in SAIC, 1998.

[c] Residential human health site-specific screening level (SSSL) and ecological screening value (ESV) as given in IT, 2000, *Final Human Health and Ecological Screening Values and PAH Background Summary Report, Fort McClellan, Calhoun County, Alabama*, July.

B - Analyte detected in laboratory or field blank at concentration greater than the reporting limit (and greater than zero).

J - Compound was positively identified; reported value is an estimated concentration.

mg/kg - Milligrams per kilogram.

NA - Not available.

ND - Not detected.

NR - Not requested.

Qual - Data validation qualifier.

Table 2-5

Subsurface Soil Analytical Results
Former 81mm Mortar Range, Parcel 137Q-X
Fort McClellan, Calhoun County, Alabama

					Sample Location:	HR-137Q-GP01					HR-137Q-GP02					HR-137Q-GP03					HR-137Q-GP04				
					Sample Number:	RH0002					RH0004					RH0006					RH0008				
					Sample Date:	12-Jun-02					12-Jun-02					12-Jun-02					18-Jun-02				
					Sample Depth (Feet):	4 - 6					4 - 6					4 - 6					1 - 2				
Parameter	Units	UBR[a]	BKG[b]	SSSL[c]	Result	Qual	>UBR	>BKG	>SSSL	Result	Qual	>UBR	>BKG	>SSSL	Result	Qual	>UBR	>BKG	>SSSL	Result	Qual	>UBR	>BKG	>SSSL
METALS																									
Aluminum	mg/kg	2.46E+04	1.36E+04	7.80E+03	9.37E+03				YES	6.28E+03					2.84E+03					6.03E+03				
Antimony	mg/kg	9.90E-01	1.31E+00	3.11E+00	ND					ND					ND					9.02E+00	J	YES	YES	YES
Arsenic	mg/kg	3.80E+01	1.83E+01	4.26E-01	2.22E+00				YES	2.27E+00				YES	1.72E+00				YES	2.28E+00				YES
Barium	mg/kg	4.50E+03	2.34E+02	5.47E+02	4.73E+00					5.41E+00					1.03E+01					9.01E+01				
Beryllium	mg/kg	2.00E+00	8.60E-01	9.60E+00	ND					ND					4.40E-01	J				ND				
Calcium	mg/kg	3.65E+03	6.37E+02	NA	3.21E+01	J				6.93E+01	J				1.59E+01	J				2.28E+02				
Chromium	mg/kg	5.50E+01	3.83E+01	2.32E+01	1.53E+01	J				8.99E+00	J				8.56E+00	J				7.31E+00				
Cobalt	mg/kg	9.60E+01	1.75E+01	4.68E+02	ND					ND					3.91E+00	J				1.68E+00	J			
Copper	mg/kg	6.10E+01	1.94E+01	3.13E+02	1.95E+00	J				1.54E+00	J				1.12E+01					2.69E+02		YES	YES	
Iron	mg/kg	4.80E+04	4.48E+04	2.34E+03	1.11E+04				YES	8.39E+03				YES	2.86E+04				YES	6.60E+03	J			YES
Lead	mg/kg	5.00E+02	3.85E+01	4.00E+02	3.60E+00	J				5.19E+00	J				1.84E+01	J				4.39E+03	J	YES	YES	YES
Magnesium	mg/kg	5.94E+03	7.66E+02	NA	8.62E+01	J				8.44E+01	J				1.79E+02					2.19E+02				
Manganese	mg/kg	1.90E+04	1.36E+03	3.63E+02	3.99E+00					1.11E+01					2.61E+02					1.41E+02				
Mercury	mg/kg	1.20E-01	7.00E-02	2.33E+00	ND					ND					ND					3.03E-02	J			
Nickel	mg/kg	3.80E+01	1.29E+01	1.54E+02	9.37E-01	J				ND					7.30E+00	J				2.82E+00				
Potassium	mg/kg	6.15E+03	7.11E+02	NA	1.07E+02	J				ND					4.18E+02	J				2.64E+02	J			
Selenium	mg/kg	5.50E-01	4.70E-01	3.91E+01	ND					ND					ND					ND				
Sodium	mg/kg	6.43E+02	7.02E+02	NA	5.34E+01	J				4.79E+01	J				5.41E+01	J				4.01E+01	J			
Thallium	mg/kg	2.40E+01	1.40E+00	5.08E-01	ND					ND					7.33E-01	J			YES	ND				
Vanadium	mg/kg	9.90E+01	6.49E+01	5.31E+01	2.42E+01	J				1.53E+01	J				1.22E+01	J				7.93E+00				
Zinc	mg/kg	8.90E+01	3.49E+01	2.34E+03	6.36E+00	J				8.75E+00	J				8.00E+00	J				5.51E+01			YES	
VOLATILE ORGANIC COMPOUNDS																									
2-Butanone	mg/kg	NA	NA	4.66E+03	NR					NR					NR					ND				
Acetone	mg/kg	NA	NA	7.76E+02	NR					NR					NR					1.40E-01	J			
Methylene chloride	mg/kg	NA	NA	8.41E+01	NR					NR					NR					ND				
Toluene	mg/kg	NA	NA	1.55E+03	NR					NR					NR					ND				
Trichlorofluoromethane	mg/kg	NA	NA	2.33E+03	NR					NR					NR					ND				
p-Cymene	mg/kg	NA	NA	1.55E+03	NR					NR					NR					ND				
PESTICIDES																									
4,4'-DDT	mg/kg	NA	NA	1.79E+00	NR					NR					NR					6.20E-03	J			
Aldrin	mg/kg	NA	NA	3.65E-02	NR					NR					NR					ND				
Endrin	mg/kg	NA	NA	2.32E+00	NR					NR					NR					5.10E-03	J			
Endrin aldehyde	mg/kg	NA	NA	2.32E-01	NR					NR					NR					1.50E-03	J			
Heptachlor	mg/kg	NA	NA	1.40E-01	NR					NR					NR					ND				
Heptachlor epoxide	mg/kg	NA	NA	6.91E-02	NR					NR					NR					ND				
alpha-Chlordane	mg/kg	NA	NA	1.69E+00	NR					NR					NR					8.90E-04	J			
beta-BHC	mg/kg	NA	NA	3.50E-01	NR					NR					NR					3.60E-03	J			
delta-BHC	mg/kg	NA	NA	2.33E+00	NR					NR					NR					ND				
gamma-BHC (Lindane)	mg/kg	NA	NA	4.85E-01	NR					NR					NR					2.00E-03	J			
HERBICIDES																									
2,2-Dichloropropanoic Acid	mg/kg	NA	NA	2.33E+02	NR					NR					NR					ND				

Table 2-5

Subsurface Soil Analytical Results
Former 81mm Mortar Range, Parcel 137Q-X
Fort McClellan, Calhoun County, Alabama

					Sample Location:	HR-137Q-GP05					HR-137Q-GP06					HR-137Q-GP07					HR-137Q-GP08				
					Sample Number:	RH0010					RH0012					RH0014					RH0016				
					Sample Date:	18-Jun-02					18-Jun-02					13-Jun-02					12-Jun-02				
					Sample Depth (Feet):	1 - 2					1 - 2					4 - 6					10 - 12				
Parameter	Units	UBR[a]	BKG[b]	SSSL[c]	Result	Qual	>UBR	>BKG	>SSSL	Result	Qual	>UBR	>BKG	>SSSL	Result	Qual	>UBR	>BKG	>SSSL	Result	Qual	>UBR	>BKG	>SSSL
METALS																									
Aluminum	mg/kg	2.46E+04	1.36E+04	7.80E+03	1.27E+04				YES	1.10E+04				YES	1.10E+04				YES	6.91E+03				
Antimony	mg/kg	9.90E-01	1.31E+00	3.11E+00	ND					ND					ND					ND				
Arsenic	mg/kg	3.80E+01	1.83E+01	4.26E-01	2.46E+00				YES	2.46E+00				YES	3.48E+00				YES	1.82E+00				YES
Barium	mg/kg	4.50E+03	2.34E+02	5.47E+02	3.87E+01					2.43E+01					4.76E+01					2.74E+01				
Beryllium	mg/kg	2.00E+00	8.60E-01	9.60E+00	ND					ND					ND					ND				
Calcium	mg/kg	3.65E+03	6.37E+02	NA	5.00E+01	J				4.15E+01	J				3.39E+01	J				2.42E+01	B			
Chromium	mg/kg	5.50E+01	3.83E+01	2.32E+01	7.58E+00					8.32E+00					1.42E+01	J				1.01E+01	J			
Cobalt	mg/kg	9.60E+01	1.75E+01	4.68E+02	3.14E+00					2.25E+00					2.81E+00	J				ND				
Copper	mg/kg	6.10E+01	1.94E+01	3.13E+02	2.76E+00					9.12E+00					5.06E+00					8.14E+00				
Iron	mg/kg	4.80E+04	4.48E+04	2.34E+03	7.06E+03	J			YES	9.04E+03	J			YES	1.74E+04				YES	8.71E+03				YES
Lead	mg/kg	5.00E+02	3.85E+01	4.00E+02	5.70E+00	J				1.06E+02	J		YES		1.09E+01	J				7.72E+00	J			
Magnesium	mg/kg	5.94E+03	7.66E+02	NA	5.62E+02					3.73E+02					3.14E+02					1.61E+02				
Manganese	mg/kg	1.90E+04	1.36E+03	3.63E+02	3.50E+01					2.26E+01					1.46E+02					5.77E+00				
Mercury	mg/kg	1.20E-01	7.00E-02	2.33E+00	3.22E-02	J				ND					4.11E-02	J				ND				
Nickel	mg/kg	3.80E+01	1.29E+01	1.54E+02	5.27E+00					3.76E+00					2.36E+00	J				2.11E+00	J			
Potassium	mg/kg	6.15E+03	7.11E+02	NA	3.42E+02	J				2.82E+02	J				8.46E+02			YES		1.43E+03			YES	
Selenium	mg/kg	5.50E-01	4.70E-01	3.91E+01	6.33E-01	J	YES	YES		ND					ND					ND				
Sodium	mg/kg	6.43E+02	7.02E+02	NA	4.41E+01	J				4.41E+01	J				4.88E+01	J				6.25E+01	J			
Thallium	mg/kg	2.40E+01	1.40E+00	5.08E-01	ND					ND					ND					ND				
Vanadium	mg/kg	9.90E+01	6.49E+01	5.31E+01	1.49E+01					1.53E+01					1.85E+01	J				1.30E+01	J			
Zinc	mg/kg	8.90E+01	3.49E+01	2.34E+03	1.55E+01					1.20E+01					8.79E+00	J				4.38E+00	B			
VOLATILE ORGANIC COMPOUNDS																									
2-Butanone	mg/kg	NA	NA	4.66E+03	NR					NR					ND					ND				
Acetone	mg/kg	NA	NA	7.76E+02	NR					NR					2.10E-02	J				7.20E-03	J			
Methylene chloride	mg/kg	NA	NA	8.41E+01	NR					NR					ND					1.40E-03	B			
Toluene	mg/kg	NA	NA	1.55E+03	NR					NR					ND					ND				
Trichlorofluoromethane	mg/kg	NA	NA	2.33E+03	NR					NR					ND					ND				
p-Cymene	mg/kg	NA	NA	1.55E+03	NR					NR					ND					ND				
PESTICIDES																									
4,4'-DDT	mg/kg	NA	NA	1.79E+00	NR					NR					ND					ND				
Aldrin	mg/kg	NA	NA	3.65E-02	NR					NR					ND					ND				
Endrin	mg/kg	NA	NA	2.32E+00	NR					NR					ND					ND				
Endrin aldehyde	mg/kg	NA	NA	2.32E-01	NR					NR					ND					ND				
Heptachlor	mg/kg	NA	NA	1.40E-01	NR					NR					ND					ND				
Heptachlor epoxide	mg/kg	NA	NA	6.91E-02	NR					NR					ND					ND				
alpha-Chlordane	mg/kg	NA	NA	1.69E+00	NR					NR					ND					ND				
beta-BHC	mg/kg	NA	NA	3.50E-01	NR					NR					ND					ND				
delta-BHC	mg/kg	NA	NA	2.33E+00	NR					NR					ND					ND				
gamma-BHC (Lindane)	mg/kg	NA	NA	4.85E-01	NR					NR					ND					ND				
HERBICIDES																									
2,2-Dichloropropanoic Acid	mg/kg	NA	NA	2.33E+02	NR					NR					ND					6.00E-03	J			

Table 2-5

Subsurface Soil Analytical Results
Former 81mm Mortar Range, Parcel 137Q-X
Fort McClellan, Calhoun County, Alabama

					Sample Location:	HR-137Q-GP09					HR-137Q-GP10					HR-137Q-GP11					HR-137Q-MW01				
					Sample Number:	RH0018					RH0020					RH0022					RH0025				
					Sample Date:	13-Jun-02					13-Jun-02					12-Jun-02					11-Jun-02				
					Sample Depth (Feet):	2 - 4					2 - 4					4 - 6					4 - 6				
Parameter	Units	UBR[a]	BKG[b]	SSSL[c]	Result	Qual	>UBR	>BKG	>SSSL	Result	Qual	>UBR	>BKG	>SSSL	Result	Qual	>UBR	>BKG	>SSSL	Result	Qual	>UBR	>BKG	>SSSL
METALS																									
Aluminum	mg/kg	2.46E+04	1.36E+04	7.80E+03	1.93E+04			YES	YES	5.48E+03					7.57E+03					6.01E+03				
Antimony	mg/kg	9.90E-01	1.31E+00	3.11E+00	ND					ND					ND					ND				
Arsenic	mg/kg	3.80E+01	1.83E+01	4.26E-01	3.69E+00				YES	1.62E+00				YES	1.93E+00				YES	1.58E+00				YES
Barium	mg/kg	4.50E+03	2.34E+02	5.47E+02	1.41E+01					1.57E+01					7.24E+01					3.25E+01	J			
Beryllium	mg/kg	2.00E+00	8.60E-01	9.60E+00	ND					ND					ND					ND				
Calcium	mg/kg	3.65E+03	6.37E+02	NA	2.52E+01	J				1.18E+02					1.22E+02					9.63E+01	J			
Chromium	mg/kg	5.50E+01	3.83E+01	2.32E+01	2.03E+01	J				9.12E+00	J				1.01E+01	J				8.38E+00				
Cobalt	mg/kg	9.60E+01	1.75E+01	4.68E+02	ND					ND					ND					3.34E+00				
Copper	mg/kg	6.10E+01	1.94E+01	3.13E+02	4.75E+00					6.72E+00					1.07E+01					4.32E+00				
Iron	mg/kg	4.80E+04	4.48E+04	2.34E+03	1.73E+04				YES	4.59E+03				YES	1.11E+04				YES	6.92E+03				YES
Lead	mg/kg	5.00E+02	3.85E+01	4.00E+02	5.84E+00	J				9.91E+01	J		YES		1.40E+02	J		YES		2.15E+01				
Magnesium	mg/kg	5.94E+03	7.66E+02	NA	2.44E+02					1.48E+02					1.75E+02					2.30E+02				
Manganese	mg/kg	1.90E+04	1.36E+03	3.63E+02	8.24E+00					3.13E+01					3.01E+01					6.32E+01				
Mercury	mg/kg	1.20E-01	7.00E-02	2.33E+00	1.03E-01	J		YES		ND					4.88E-02	J				ND				
Nickel	mg/kg	3.80E+01	1.29E+01	1.54E+02	1.54E+00	J				2.27E+00	J				1.85E+00	J				3.13E+00	B			
Potassium	mg/kg	6.15E+03	7.11E+02	NA	1.65E+02	J				2.97E+02	J				2.98E+02	J				3.66E+02	J			
Selenium	mg/kg	5.50E-01	4.70E-01	3.91E+01	ND					ND					ND					ND				
Sodium	mg/kg	6.43E+02	7.02E+02	NA	4.19E+01	J				4.57E+01	J				4.68E+01	J				5.69E+01	J			
Thallium	mg/kg	2.40E+01	1.40E+00	5.08E-01	ND					ND					ND					ND				
Vanadium	mg/kg	9.90E+01	6.49E+01	5.31E+01	2.95E+01	J				8.11E+00	J				1.18E+01	J				8.48E+00				
Zinc	mg/kg	8.90E+01	3.49E+01	2.34E+03	7.01E+00	J				1.03E+01	J				1.42E+01	J				9.41E+00	J			
VOLATILE ORGANIC COMPOUNDS																									
2-Butanone	mg/kg	NA	NA	4.66E+03	NR					9.30E-03	J				7.20E-03	J				ND				
Acetone	mg/kg	NA	NA	7.76E+02	NR					2.40E-01	J				1.60E-01	J				1.70E-02	J			
Methylene chloride	mg/kg	NA	NA	8.41E+01	NR					ND					ND					ND				
Toluene	mg/kg	NA	NA	1.55E+03	NR					1.90E-03	J				ND					ND				
Trichlorofluoromethane	mg/kg	NA	NA	2.33E+03	NR					ND					1.60E-03	J				ND				
p-Cymene	mg/kg	NA	NA	1.55E+03	NR					2.00E-02					ND					ND				
PESTICIDES																									
4,4'-DDT	mg/kg	NA	NA	1.79E+00	NR					ND					ND					ND				
Aldrin	mg/kg	NA	NA	3.65E-02	NR					1.50E-03	J				1.00E-03	J				ND				
Endrin	mg/kg	NA	NA	2.32E+00	NR					2.30E-03	J				ND					ND				
Endrin aldehyde	mg/kg	NA	NA	2.32E-01	NR					ND					ND					ND				
Heptachlor	mg/kg	NA	NA	1.40E-01	NR					ND					ND					ND				
Heptachlor epoxide	mg/kg	NA	NA	6.91E-02	NR					ND					ND					ND				
alpha-Chlordane	mg/kg	NA	NA	1.69E+00	NR					1.00E-03	J				ND					ND				
beta-BHC	mg/kg	NA	NA	3.50E-01	NR					6.70E-04	J				ND					1.60E-03	J			
delta-BHC	mg/kg	NA	NA	2.33E+00	NR					ND					ND					6.40E-04	J			
gamma-BHC (Lindane)	mg/kg	NA	NA	4.85E-01	NR					8.70E-04	J				ND					ND				
HERBICIDES																									
2,2-Dichloropropanoic Acid	mg/kg	NA	NA	2.33E+02	NR					ND					1.40E-02	J				ND				

Table 2-5

Subsurface Soil Analytical Results
Former 81mm Mortar Range, Parcel 137Q-X
Fort McClellan, Calhoun County, Alabama

					Sample Location:	HR-137Q-MW02					HR-137Q-MW03					HR-137Q-MW04				
					Sample Number:	RH0027					RH0030					RH0032				
					Sample Date:	11-Jun-02					12-Jun-02					11-Jun-02				
					Sample Depth (Feet):	6 - 8					6 - 8					6 - 8				
Parameter	Units	UBR[a]	BKG[b]	SSSL[c]	Result	Qual	>UBR	>BKG	>SSSL	Result	Qual	>UBR	>BKG	>SSSL	Result	Qual	>UBR	>BKG	>SSSL
METALS																				
Aluminum	mg/kg	2.46E+04	1.36E+04	7.80E+03	1.65E+04			YES	YES	1.01E+04				YES	1.04E+04				YES
Antimony	mg/kg	9.90E-01	1.31E+00	3.11E+00	ND					ND					ND				
Arsenic	mg/kg	3.80E+01	1.83E+01	4.26E-01	5.91E+00				YES	3.04E+00				YES	3.38E+00				YES
Barium	mg/kg	4.50E+03	2.34E+02	5.47E+02	6.88E+01	J				2.17E+01					1.31E+01	J			
Beryllium	mg/kg	2.00E+00	8.60E-01	9.60E+00	5.99E-01	J				ND					ND				
Calcium	mg/kg	3.65E+03	6.37E+02	NA	9.02E+01	J				9.33E+01	J				4.71E+01	J			
Chromium	mg/kg	5.50E+01	3.83E+01	2.32E+01	1.70E+01					3.72E+01	J			YES	1.63E+01				
Cobalt	mg/kg	9.60E+01	1.75E+01	4.68E+02	5.75E+00					ND					ND				
Copper	mg/kg	6.10E+01	1.94E+01	3.13E+02	9.55E+00					1.60E+01					1.20E+01				
Iron	mg/kg	4.80E+04	4.48E+04	2.34E+03	2.92E+04				YES	1.55E+04				YES	1.18E+04				YES
Lead	mg/kg	5.00E+02	3.85E+01	4.00E+02	2.73E+01	J				9.78E+01	J		YES		1.04E+02			YES	
Magnesium	mg/kg	5.94E+03	7.66E+02	NA	7.06E+02					2.66E+02					1.54E+02				
Manganese	mg/kg	1.90E+04	1.36E+03	3.63E+02	1.52E+02	J				2.35E+01					2.87E+01				
Mercury	mg/kg	1.20E-01	7.00E-02	2.33E+00	4.97E-02	J				ND					3.26E-02	J			
Nickel	mg/kg	3.80E+01	1.29E+01	1.54E+02	6.55E+00					2.13E+00	J				2.02E+00	B			
Potassium	mg/kg	6.15E+03	7.11E+02	NA	2.05E+03			YES		1.04E+03			YES		3.27E+02	J			
Selenium	mg/kg	5.50E-01	4.70E-01	3.91E+01	ND					ND					ND				
Sodium	mg/kg	6.43E+02	7.02E+02	NA	6.54E+01	J				5.62E+01	J				4.50E+01	J			
Thallium	mg/kg	2.40E+01	1.40E+00	5.08E-01	9.79E-01	B			YES	ND					ND				
Vanadium	mg/kg	9.90E+01	6.49E+01	5.31E+01	1.93E+01	J				2.86E+01	J				2.11E+01				
Zinc	mg/kg	8.90E+01	3.49E+01	2.34E+03	1.82E+01	J				7.75E+00	B				6.00E+00	J			
VOLATILE ORGANIC COMPOUNDS																				
2-Butanone	mg/kg	NA	NA	4.66E+03	ND					7.70E-03	J				ND				
Acetone	mg/kg	NA	NA	7.76E+02	1.40E-02	J				7.00E-02	J				4.30E-02	J			
Methylene chloride	mg/kg	NA	NA	8.41E+01	ND					ND					ND				
Toluene	mg/kg	NA	NA	1.55E+03	ND					ND					ND				
Trichlorofluoromethane	mg/kg	NA	NA	2.33E+03	ND					ND					ND				
p-Cymene	mg/kg	NA	NA	1.55E+03	ND					ND					ND				
PESTICIDES																				
4,4'-DDT	mg/kg	NA	NA	1.79E+00	ND					ND					ND				
Aldrin	mg/kg	NA	NA	3.65E-02	ND					ND					ND				
Endrin	mg/kg	NA	NA	2.32E+00	ND					ND					ND				
Endrin aldehyde	mg/kg	NA	NA	2.32E-01	ND					ND					ND				
Heptachlor	mg/kg	NA	NA	1.40E-01	ND					1.60E-03	J				ND				
Heptachlor epoxide	mg/kg	NA	NA	6.91E-02	ND					1.20E-03	J				ND				
alpha-Chlordane	mg/kg	NA	NA	1.69E+00	ND					ND					ND				
beta-BHC	mg/kg	NA	NA	3.50E-01	ND					ND					ND				
delta-BHC	mg/kg	NA	NA	2.33E+00	ND					ND					ND				
gamma-BHC (Lindane)	mg/kg	NA	NA	4.85E-01	ND					ND					ND				
HERBICIDES																				
2,2-Dichloropropanoic Acid	mg/kg	NA	NA	2.33E+02	ND					ND					ND				

Table 2-5

Subsurface Soil Analytical Results
Former 81mm Mortar Range, Parcel 137Q-X
Fort McClellan, Calhoun County, Alabama

Analyses performed using U.S. Environmental Protection Agency (EPA) SW-846 analytical methods.

[a] UBR - Upper background range as given in Science Applications International Corporation (SAIC), 1998, *Final Background Metals Survey Report, Fort McClellan, Alabama*, July.

[b] BKG - Background. Concentration listed is two times (2x) the arithmetic mean of background metals concentration given in SAIC, 1998.

[c] Residential human health site-specific screening level (SSSL) as given in IT Corporation (2000), *Final Human Health and Ecological Screening Values and PAH Background Summary Report, Fort McClellan, Calhoun County, Alabama*, July.

B - Analyte detected in laboratory or field blank at concentration greater than the reporting limit (and greater than zero).

J - Compound was positively identified; reported value is an estimated concentration.

mg/kg - Milligrams per kilogram.

NA - Not available.

ND - Not detected.

NR - Not requested.

Qual - Data validation qualifier.

Table 2-6

Groundwater Analytical Results
Former 81mm Mortar Range, Parcel 137Q-X
Fort McClellan, Calhoun County, Alabama

Sample Location					HR-137Q-MW01					HR-137Q-MW02					HR-137Q-MW04				
Sample Number					RH3001					RH3002					RH3005				
Sample Date					10-Jul-02					8-Jul-02					12-Jul-02				
Parameter	Units	UBR[a]	BKG[b]	SSSL[c]	Result	Qual	>UBR	>BKG	>SSSL	Result	Qual	>UBR	>BKG	>SSSL	Result	Qual	>UBR	>BKG	>SSSL
DISSOLVED METALS																			
Aluminum	mg/L	9.60E+00	2.34E+00	1.56E+00	6.48E-02	J				NR					NR				
Arsenic	mg/L	2.24E-01	1.78E-02	4.40E-05	2.73E-03	J			YES	NR					NR				
Barium	mg/L	4.01E-01	1.27E-01	1.10E-01	6.78E-02	J				NR					NR				
Calcium	mg/L	4.52E+02	5.65E+01	NA	1.43E+00					NR					NR				
Iron	mg/L	2.58E+01	7.04E+00	4.69E-01	3.66E-01	J				NR					NR				
Magnesium	mg/L	1.49E+02	2.13E+01	NA	9.40E-01	J				NR					NR				
Manganese	mg/L	5.82E+00	5.81E-01	7.35E-02	3.30E-01				YES	NR					NR				
Potassium	mg/L	6.85E+01	7.20E+00	NA	1.07E+01			YES		NR					NR				
Sodium	mg/L	6.47E+01	1.48E+01	NA	1.42E+00					NR					NR				
TOTAL METALS																			
Aluminum	mg/L	9.60E+00	2.34E+00	1.56E+00	1.02E+01	J	YES	YES	YES	1.88E+00	J			YES	4.10E+00	J		YES	YES
Arsenic	mg/L	2.24E-01	1.78E-02	4.40E-05	4.92E-03	J			YES	2.00E-03	J			YES	ND				
Barium	mg/L	4.01E-01	1.27E-01	1.10E-01	1.26E-01				YES	4.84E-02					1.49E-02				
Calcium	mg/L	4.52E+02	5.65E+01	NA	1.85E+00					8.74E-01	J				9.49E-01	J			
Chromium	mg/L	NA	NA	4.69E-03	1.15E-02	J			YES	ND					ND				
Copper	mg/L	2.35E-01	2.55E-02	6.26E-02	7.29E-03	J				ND					ND				
Iron	mg/L	2.58E+01	7.04E+00	4.69E-01	8.29E+00	J		YES	YES	5.72E-01	J			YES	1.23E+00				YES
Lead	mg/L	2.70E-02	8.00E-03	1.50E-02	3.57E-03	J				ND					ND				
Magnesium	mg/L	1.49E+02	2.13E+01	NA	1.79E+00					6.10E-01	J				6.42E-01	J			
Manganese	mg/L	5.82E+00	5.81E-01	7.35E-02	2.08E-01				YES	1.09E-01				YES	2.03E-02	J			
Potassium	mg/L	6.85E+01	7.20E+00	NA	1.19E+01			YES		6.01E+00					4.26E+00	J			
Sodium	mg/L	6.47E+01	1.48E+01	NA	9.03E-01	J				8.20E-01	J				1.10E+00				
Vanadium	mg/L	1.10E-02	1.70E-02	1.10E-02	8.10E-03	J				ND					ND				
Zinc	mg/L	1.16E+00	2.20E-01	4.69E-01	3.80E-02	J				ND					ND				
VOLATILE ORGANIC COMPOUNDS																			
Chloroform	mg/L	NA	NA	1.15E-03	2.20E-04	J				ND					ND				

Analyses performed using U.S. Environmental Protection Agency (EPA) SW-846 analytical methods.

[a] UBR - Upper background range as given in Science Applications International Corporation (SAIC), 1998, *Final Background Metals Survey Report, Fort McClellan, Alabama*, July.

[b] BKG - Background. Concentration listed is two times (2x) the arithmetic mean of background metals concentration given in SAIC, 1998.

[c] Residential human health site-specific screening level (SSSL) as given in IT Corporation (2000), *Final Human Health and Ecological Screening Values and PAH Background Summary Report, Fort McClellan, Calhoun County, Alabama*, July.

B - Analyte detected in laboratory or field blank at concentration greater than the reporting limit (and greater than zero).

J - Compound was positively identified; reported value is an estimated concentration.

mg/L - Milligrams per liter.

NA - Not available.

ND - Not detected.

NR - Not requested.

Qual - Data validation qualifier.

- Antimony (5.21 and 5.69 mg/kg) exceeded its ESV (3.5 mg/kg) and upper background range (2.6 mg/kg) at two sample locations (HR-137Q-MW01 and HR-137Q-GP04).

- Beryllium (1.14 mg/kg) exceeded its ESV (1.1 mg/kg) and upper background range (0.87 mg/kg) at one sample location (HR-137Q-DEP01).

- Copper (40.2 to 178 mg/kg) exceeded its ESV (40 mg/kg) and upper background range (24 mg/kg) at six sample locations (HR-137Q-DEP05, HR-137Q-GP04, HR-137Q-GP06, HR-137Q-GP08, HR-137Q-MW03, and HR-137Q-MW04).

- Lead (144 to 3460 mg/kg) exceeded its ESV (50 mg/kg) and upper background range (83 mg/kg) at 13 sample locations.

Lead concentrations exceeding its ESV and upper background range in surface and depositional soils are presented in Figure 2-2.

Volatile Organic Compounds. Eleven surface and depositional soil samples were analyzed for VOCs. A total of six VOCs (2-butanone, acetone, methylene chloride, p-cymene, toluene, and trichlorofluoromethane) were detected in the samples at concentrations below SSSLs and ESVs.

Semivolatile Organic Compounds. Eleven surface and depositional soil samples were analyzed for SVOCs. SVOCs were not detected in the samples.

Pesticides. Eleven surface and depositional soil samples were analyzed for pesticides. A total of sixteen pesticides were detected in the samples. The detected pesticide concentrations were all below SSSLs; however, seven of the pesticides exceeded ESVs:

- 4,4'-Dichlorodiphenyldichloroethane (DDD) (0.0027 to 0.0083 mg/kg) exceeded its ESV (0.0025 mg/kg) at six sample locations.

- 4,4'-Dichlorodiphenyldichloroethene (DDE) (0.0032 to 0.011 mg/kg) exceeded its ESV (0.0025 mg/kg) at eight sample locations.

- 4,4'-Dichlorodiphenyltrichloroethane (DDT) (0.004 to 0.006 mg/kg) exceeded its ESV (0.0025 mg/kg) at four sample locations.

- Beta-betahexachlorocyclohexane (BHC) (0.0022 to 0.012 mg/kg) exceeded its ESV (0.001 mg/kg) at five sample locations.

- Dieldrin (0.00084 to 0.0018 mg/kg) exceeded its ESV (0.0005) at four sample locations.

PARCEL 137Q-X

E 684,900

E 687,600

N 1,181,600

N 1,179,300

MAIN POST BOUNDARY

FLOW

HR-137Q-DEP06 (7.51)

HR-137Q-GP01 (41.1)

HR-137Q-GP02 (58.9)

HR-137Q-GP03 (194)

HR-137Q-DEP01 (144)

HR-137Q-DEP05 (442)

HR-137Q-GP05 (11.2)

HR-137Q-DEP03 (20.0)

HR-137Q-MW02 (394)

HR-137Q-GP04 (3,460)

HR-137Q-MW03(DP) (1,710)

HR-137Q-GP08 (503)

HR-137Q-GP10 (61.4)

HR-137Q-GP06 (632)

HR-137Q-MW04 (2,330)

HR-137Q-DEP04 (34.2)

HR-137Q-MW01 (717)

HR-137Q-GP07 (334)

HR-137Q-GP11 (382)

HR-137Q-GP09 (380)

HR-137Q-DEP02 (26.1)

50
100
500
1000

LEGEND

- UNIMPROVED ROADS AND PARKING
- PAVED ROADS AND PARKING
- BUILDING
- TOPOGRAPHIC CONTOURS (CONTOUR INTERVAL - 25 FOOT)
- TREES / TREELINE
- AREA OF INVESTIGATION
- SURFACE DRAINAGE / CREEK
- TRENCH WITH NUMEROUS SURFACE DEPRESSIONS THROUGHOUT
- SURFACE AND SUBSURFACE SOIL SAMPLE LOCATION
- MONITORING WELL / GROUNDWATER, SURFACE AND SUBSURFACE SOIL SAMPLE LOCATION
- ▲ DEPOSITIONAL SOIL SAMPLE LOCATION
- 50 LEAD CONCENTRATION (mg/kg) (DASHED WHERE INFERRED)
- (334) CONCENTRATION IN MILLIGRAMS PER KILOGRAM (mg/kg)
- UBR UPPER BACKGROUND RANGE
- ESV ECOLOGICAL SCREENING VALUE

NOTES:

1. ESV FOR LEAD IN SURFACE AND DEPOSITIONAL SOIL IS 50 mg/kg.
2. UBR FOR LEAD IN SURFACE AND DEPOSITIONAL SOIL IS 83 mg/kg.

SCALE
0 300 600 FEET

FIGURE 2-2
LEAD IN SURFACE AND DEPOSITIONAL SOIL FORMER 81mm MORTAR RANGE PARCEL 137Q-X

U. S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
FORT McCLELLAN
CALHOUN COUNTY, ALABAMA
Contract No. DACA21-96-D-0018

IT CORPORATION
A Member of The IT Group

- Endrin (0.0016 to 0.0032 mg/kg) exceeded its ESV (0.001 mg/kg) at five sample locations.

- Gamma-BHC (lindane) (0.0006 to 0.00088 mg/kg) exceeded its ESV (0.00005 mg/kg) at four sample locations.

The majority of the pesticide results were flagged with a "J" data qualifier, indicating that the results were estimated.

Herbicides. Eleven surface and depositional soil samples were analyzed for herbicides. A total of three herbicides (2,2-dichloropropanoic acid, 2,4-dichlorophenoxyacetic acid, and 2-[2-methyl-4-chlorophenoxy] propionic acid [MCPP]) were detected in the samples at concentrations below SSSLs. The herbicide results were also below ESVs except for MCPP (1.5 to 1.6 mg/kg), which exceeded its ESV (0.1 mg/kg) at three sample locations (HR-137Q-GP10, HR-137Q-GP11, and HR-137Q-MW04). The MCPP results were all "J" flagged, indicating that the compound was detected at estimated concentrations below method reporting limits.

Explosives. Two explosives (4-amino-2,6-dinitrotoluene and 1,3,5-trinitrobenzene) were detected in one surface soil sample each. The explosives results were below SSSLs; however, the 1,3,5-trinitrobenzene result (1 mg/kg) exceeded its ESV (0.376 mg/kg) at sample location HR-137Q-GP11.

2.1.2.2 Subsurface Soil Analytical Results

Fifteen subsurface soil samples were collected at the Former 81mm Mortar Range, Parcel 137Q-X, as shown on Figure 2-1. Analytical results were compared to residential human health SSSLs and metals background concentrations, as presented in Table 2-5.

Metals. A total of 21 metals were detected in subsurface soil samples. The concentrations of seven metals (aluminum, antimony, arsenic, chromium, iron, lead, and thallium) exceeded SSSLs. Of the metals that exceeded SSSLs, aluminum (at HR-137Q-GP09 and HR-137Q-MW02), antimony (HR-137Q-GP04), and lead (HR-137Q-GP04) also exceeded their respective background values. These metals results, however, were within their respective upper background ranges, except for the following:

- Antimony (9.02 mg/kg) exceeded its SSSL (3.11 mg/kg) and upper background range (0.99 mg/kg) at one sample location (HR-137Q-GP04).

- Lead (4,390 mg/kg) exceeded its SSSL (400 mg/kg) and upper background range (500 mg/kg) at one sample location (HR-137Q-GP04).

Volatile Organic Compounds. Nine subsurface soil samples were analyzed for VOCs. A total of six VOCs (2-butanone, acetone, methylene chloride, p-cymene, toluene, and trichlorofluoromethane) were detected in the samples. VOC concentrations in the subsurface soil samples ranged from 0.0014 to 0.24 mg/kg and were below SSSLs.

Semivolatile Organic Compounds. Nine subsurface soil samples were analyzed for SVOCs. SVOCs were not detected in the samples.

Pesticides. Nine subsurface soil samples were analyzed for pesticides. A total of ten pesticides were detected in the samples. The pesticide results were flagged with a "J" data qualifier, signifying that the results were estimated. The pesticide concentrations ranged from 0.00064 to 0.0062 mg/kg and were all below SSSLs.

Herbicides. Nine subsurface soil samples were analyzed for herbicides. One herbicide (2,2-dichloropropanoic acid) was detected at two sample locations (HR-137Q-GP08 and HR-137Q-GP11) at concentrations below its SSSL.

Explosives. Explosives were not detected in the subsurface soil samples collected at the site.

2.1.2.3 Groundwater Analytical Results

Three groundwater samples were collected for chemical analysis at the Former 81mm Mortar Range, Parcel 137Q-X, at the locations shown on Figure 2-1. Analytical results were compared to residential human health SSSLs and metals background screening values, as presented in Table 2-6.

Total Metals. Fourteen metals were detected in groundwater samples collected at the site. The concentrations of six metals (aluminum, arsenic, barium, chromium, iron, and manganese) exceeded SSSLs. Of the metals exceeding SSSLs, aluminum (at HR-137Q-MW01 and HR-137Q-MW04) and iron (HR-137Q-MW01) also exceeded their respective background concentrations. However the aluminum and iron results were within their respective upper background ranges, except the aluminum result at sample location HR-137Q-MW01 (10.2 milligrams per liter [mg/L]), which marginally exceeded its upper background range (9.6 mg/L) (Appendix F). Chromium exceeded its SSSL in one sample; however, there is not a background value for chromium.

Dissolved Metals. One groundwater sample, HR-137Q-MW01, was analyzed for dissolved metals due to high turbidity of greater than 1,000 ntu in the groundwater after the purging of the

well as recorded in Table 2-2. Nine metals (aluminum, arsenic, barium, calcium, iron, magnesium, manganese, potassium, and sodium) were detected in the sample. Arsenic and manganese concentrations exceeded SSSLs but were below their respective background values.

Volatile Organic Compounds. One VOC, chloroform, was detected at one groundwater sample location (HR-137Q-MW01). The chloroform result was below its SSSL.

Semivolatile Organic Compounds. SVOCs were not detected in the groundwater samples collected at the site.

Pesticides. Pesticides were not detected in the groundwater samples collected at the site.

Herbicides. Herbicides were not detected in the groundwater samples collected at the site.

Explosives. Explosives were not detected in the groundwater samples collected at the site.

2.1.3 SI Summary and Conclusions

Comparison of the analytical data to the SSSLs, ESVs, and background screening values indicates that the human health chemicals of potential concern at the Former 81mm Mortar Range, Parcel 137Q-X, are metals in soils. Two metals (antimony and lead) exceeded their respective SSSLs and upper background ranges at seven surface and one subsurface soil sample locations.

Constituents of potential ecological concern include metals, pesticides, one herbicide, and one explosive compound in surface soil. Four metals (antimony, beryllium, copper, and lead) exceeded their respective ESVs and upper background ranges at 13 surface soil sample locations. Several pesticides were detected at concentrations exceeding their respective ESVs at 10 surface and depositional soil sample locations. One herbicide (MCPP) and one explosive (1,3,5-trinitrobenzene) were also detected at levels exceeding their respective ESVs in a limited number of surface and depositional soil samples.

Based on the results of the SI, past training operations at the Former 81mm Mortar Range, Parcel 137Q-X, appear to have adversely impacted the environment. The lead detected in site media may pose an unacceptable risk to human health and the environment. The SI data for Parcel 137Q-X were presented to the BCT in November 2002. Therefore, the BCT recommended that the nature and extent of the lead contamination in soil be defined at the Former 81mm Mortar Range, Parcel 137Q-X. Also, the BCT agreed that the four existing monitoring wells at Parcel 137Q-X will be resampled to verify the previous SI results and to determine if contaminants are present.

3.0 Site-Specific Data Quality Objectives

3.1 Overview

The data quality objective (DQO) process is followed to establish data requirements. This process ensures that the proper quantity and quality of data are generated to support the decision-making process associated with the future action for Former 81mm Mortar Range, Parcel 137Q-X. This section incorporates the components of the DQO process described in the EPA publication *Guidance for the Data Quality Objectives Process* (EPA, 2000). The DQO process as applied to the Former 81mm Mortar Range, Parcel 137Q-X, is described in more detail in Section 3.4 of this RI SFSP. Table 3-1 provides a summary of the factors used to determine the appropriate quantity of samples and the procedures necessary to meet the objectives of the RI and establish a basis for future action at this site.

To support the RI at Former 81mm Mortar Range, Parcel 137Q-X, five sample media will be collected for analysis: groundwater, surface soil, subsurface soil, surface water, and sediment. The samples will be analyzed for this RI using EPA SW-846 methods, including Update III Methods where applicable, as presented in Chapter 4.0 in this RI SFSP and Section 5.0 of the QAP. Data will be reported in accordance with the definitive data requirements of the USACE Engineer Manual, *Chemical Quality Assurance for Hazardous, Toxic and Radioactive Waste (HTRW) Projects* (USACE, 1997) and evaluated by the stipulated requirements for the generation of definitive data (Section 7.2.2 of the QAP). Chemical data will be reported by the laboratory via hard-copy data packages using Contract Laboratory Program-like forms along with electronic copies. These packages will be validated in accordance with EPA National Functional Guidelines Level III criteria.

3.2 Data Users and Available Data

The available data related to the RI SFSP at the Former 81mm Mortar Range, Parcel 137Q-X, presented in Table 3-1, have been used to formulate a site-specific conceptual model. This conceptual model was developed to support the development of this RI SFSP, which is necessary to meet the objectives of these activities and to establish a basis for future action at the site. The data users for information generated during field activities are primarily EPA, USACE, ADEM, FTMC, and the USACE supporting contractors. This RI SFSP, along with the necessary companion documents, has been designed to provide the regulatory agencies with sufficient detail to reach a determination as to the adequacy of the scope of work. The program has also been designed to provide defensible information required to confirm or deny the existence and nature of residual chemical contamination in site media.

Table 3-1

Summary of Data Quality Objectives
Former 81mm Mortar Range, Parcel 137Q-X
Remedial Investigation
Fort McClellan, Calhoun County, Alabama

Users	Available Data	Conceptual Site Model	Media of Concern	Data Uses and Objectives	Data Types	Analytical Level	Data Quantity
EPA, ADEM USACE, DOD FTMC, IT Corporation Other contractors, and possible future land users	Previous site investigation by IT that show potential metals contamination.	Contaminant Source Former 81mm Mortar Range training activities. Migration Pathways Rain runoff and erosion to surface soil, infiltration and leaching to subsurface soil and groundwater, dust emissions and volatilization to ambient air, runoff to surface water, erosion to sediment, and biotransfer to venison. Potential Receptors Recreational site user (current and future) Resident (future) PSSC Primarily metals	Surface soil Subsurface Soil Groundwater Surface water Sediment	RI to delineate vertical and horizontal extent of contamination in the site media Definitive quality data for future decision-making	Surface soil VOCs, SVOCs, metals, nitroaromatic/nitramine explosives, chlorinated and organophosphorus pesticides, chlorinated herbicides and PCBs	Definitive data in data packages (as defined in USACE EM200-1-6)	20 surface soil samples + QC
					Subsurface Soil VOCs, SVOCs, metals, nitroaromatic/nitramine explosives, chlorinated and organophosphorus pesticides, chlorinated herbicides and PCBs	Definitive data in data packages (as defined in USACE EM200-1-6)	30 subsurface soil samples + QC
					Groundwater VOCs, SVOCs, metals, nitroaromatic/nitramine explosives, chlorinated and organophosphorus pesticides, chlorinated herbicides and PCBs	Definitive data in data packages (as defined in USACE EM200-1-6)	4 groundwater samples + QC
					Surface water VOCs, SVOCs, metals, nitroaromatic/nitramine explosives, chlorinated and organophosphorus pesticides, chlorinated herbicides and PCBs	Definitive data in data packages (as defined in USACE EM200-1-6)	7 surface water samples + QC
					Sediment VOCs, SVOCs, metals, nitroaromatic/nitramine explosives, chlorinated and organophosphorus pesticides, chlorinated herbicides and PCBs; plus TOC and grain size	Definitive data in data packages (as defined in USACE EM200-1-6)	7 sediment samples + QC

ADEM - Alabama Department of Environmental Management.
EPA - U.S. Environmental Protection Agency.
FTMC - Fort McClellan.
PSSC - Potential site-specific chemical.
QC - Quality control.
RI - Remedial investigation.
TOC - Total organic carbon
PCB - polychlorinated biphenyls
VOC - Volatile Organic Compounds.
SVOC - Semi-volatile Organic Compounds.
EM200-1-6 - USACE Engineering Manual, Chemical Quality Assurance for HTRW Projects, October 10, 1997.
USACE - U.S. Army Corps of Engineers.

3.3 Conceptual Site Exposure Model

The conceptual site exposure model (CSEM) provides the basis for identifying and evaluating potential risks to human health in the risk assessment. The CSEM includes all receptors and potential exposure pathways appropriate to all plausible scenarios. The CSEM facilitates consistent and comprehensive evaluation of risk to human health through graphically presenting all possible exposure pathways, including all sources, release and transport pathways, and exposure routes. In addition, the CSEM helps to ensure that potential pathways are not overlooked. The elements of a complete exposure pathway and CSEM are:

- Source (i.e., contaminated environmental) media
- Contaminant release mechanisms
- Contaminant transport pathways
- Receptors
- Exposure pathways.

Contaminant release mechanisms and transport pathways are not relevant for direct receptor contact with a contaminated source medium.

Primary contaminant release mechanisms were associated with training exercises and possibly through leaks and spills. Potential contaminant transport pathways include rain runoff and erosion to surface soil, infiltration and leaching to subsurface soil and groundwater, dust emissions and volatilization to ambient air, surface water runoff and erosion to surface water and sediment, and biotransfer to deer through browsing.

The Former 81mm Mortar Range, Parcel 137Q-X, is a heavily wooded area and is not currently used by Base personnel. The site is not fenced and, thus, is accessible to trespassers. Because trespassers or hunters may access the site, a recreational site user who hunts will be evaluated for the current land-use scenario. The site is no longer used for training and no construction is occurring at the site, nor is it currently maintained by a groundskeeper. Therefore, the only plausible receptor evaluated under the current land-use scenario is the recreational site user who hunts. Fish ingestion will not be evaluated because the surface water is insufficient to support fish for consumption. Other potential receptors considered, but not included under current land-use scenarios, are the:

- ***Groundskeeper.*** The site is not currently maintained by a groundskeeper.
- ***Construction Worker.*** The site is unused, and no development or construction is occurring.
- ***Resident.*** The site is not currently used for residential purposes.

Future land use for the area of investigation is shown as part of the remediation reserve to be used for passive recreation (EDAW, Inc., 1997). Potential receptor scenarios evaluated for the future include the following:

- ***Recreational Site User.*** Because future land use is likely passive recreation, and hunting may be possible, the recreational site user who hunts is included.

- ***Resident.*** Although the site is not expected to be used for residential purposes, the resident is considered in order to provide information for the project manager and regulators.

A summary of relevant contaminant release and transport mechanisms, source and exposure media, and receptor scenarios and exposure pathways for this site is provided in Table 3-1 and Figure 3-1.

3.4 Decision-Making Process, Data Uses, and Needs

3.4.1 Risk Evaluation

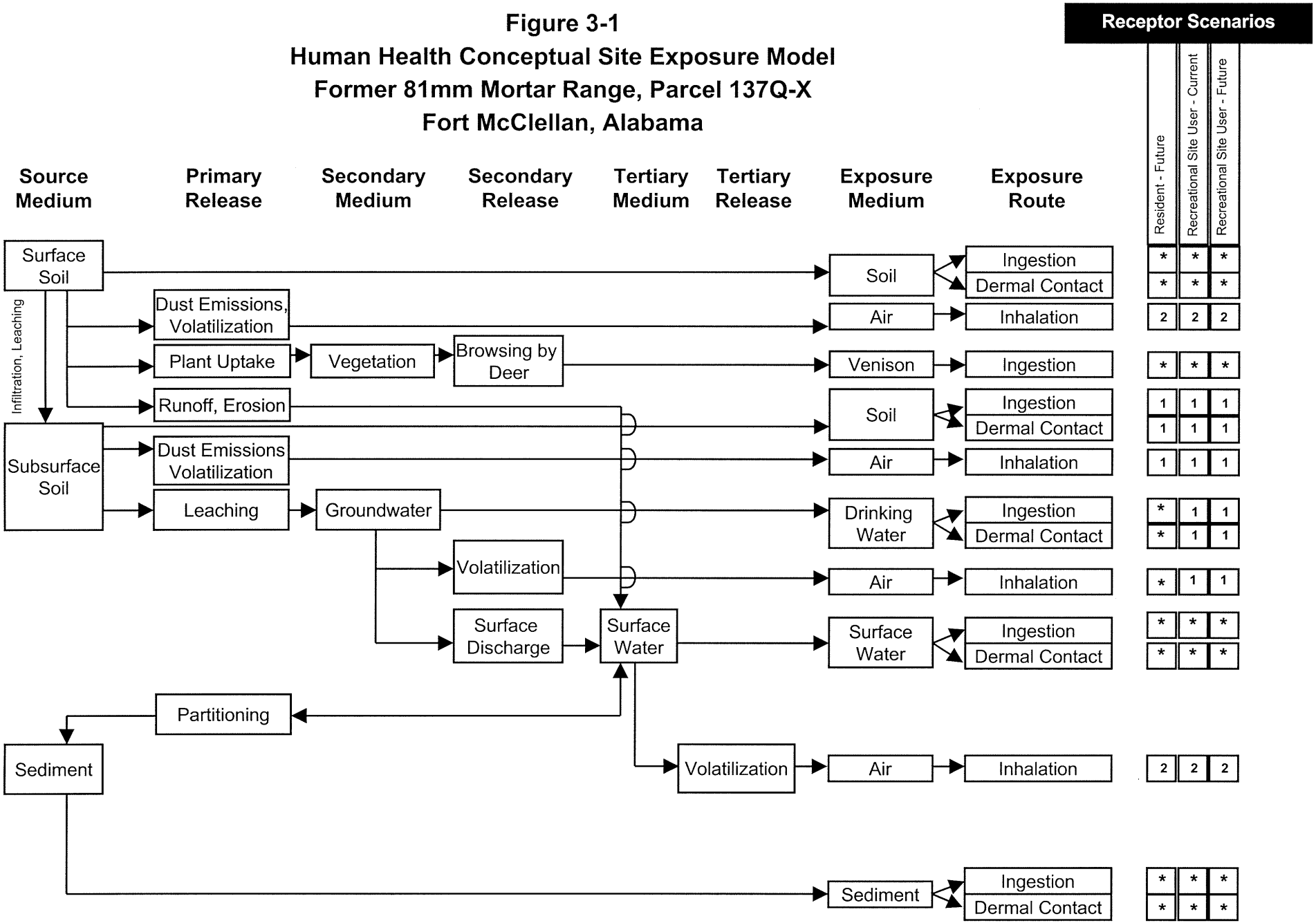
Confirmation of contamination at the Former 81mm Mortar Range, Parcel 137Q-X, will be based on using EPA-definitive data to determine whether or not PSSCs are detected in site media. Results from these analyses will be compared with SSSLs, ESVs, and background values to determine if PSSCs are present at the site at concentrations that pose an unacceptable risk to human health or the environment. Definitive data will be adequate for confirming the presence of site contamination and for supporting an FS and risk assessment. Assessment of potential ecological risk associated with sites or parcels (e.g., surface water and sediment sampling, specific ecological assessment methods) will be addressed in accordance with the procedures in Section 5.3 of the installation-wide work plan (IT, 2002b).

3.4.2 Data Types and Quality

Surface soil, subsurface soil, groundwater, surface water, and sediment will be sampled and analyzed to meet the objectives of the RI at the Former 81mm Mortar Range, Parcel 137Q-X. In association with these definitive samples, quality assurance/quality control (QA/QC) samples will be collected for sample types as described in Chapter 5.0 of this RI SFSP.

Samples will be analyzed by EPA-approved SW-846 methods Update III, where available, comply with EPA-definitive data requirements, and be reported using hard-copy data packages. In addition to meeting the quality needs of this RI SFSP, data analyzed at this level of quality are appropriate for all phases of site characterization, RI, and risk assessment.

Figure 3-1
Human Health Conceptual Site Exposure Model
Former 81mm Mortar Range, Parcel 137Q-X
Fort McClellan, Alabama



* = Complete exposure pathway evaluated in the streamlined risk assessment.
1 = Incomplete exposure pathway.
2 = Although theoretically complete, this pathway is judged to be insignificant and is not evaluated in the streamlined risk assessment.

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3.4.3 Precision, Accuracy, and Completeness

Laboratory requirements of precision, accuracy, and completeness for this RI SFSP are defined in Section 3.1 and presented in Section 5.0 of the QAP (IT, 2002a).